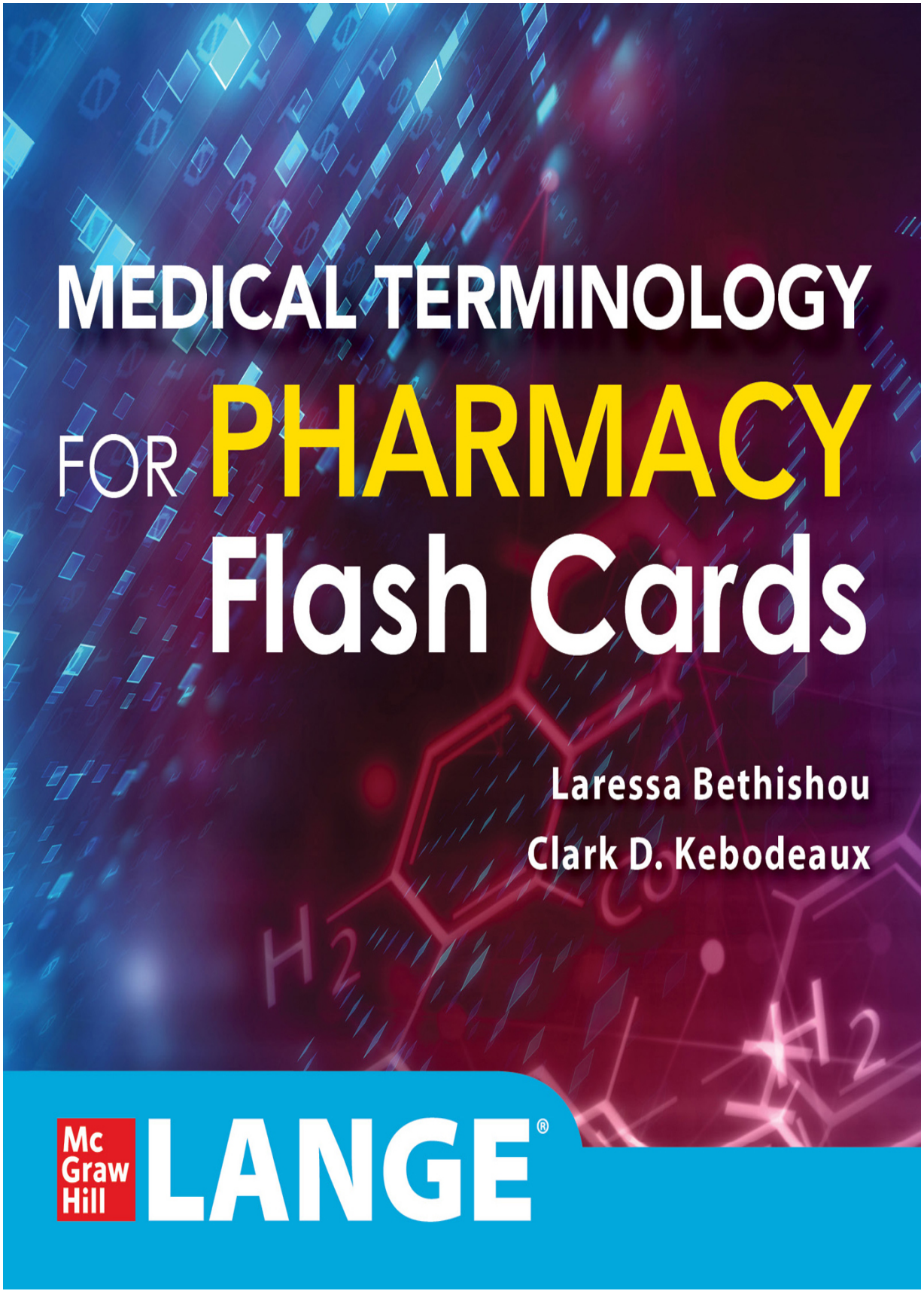
MEDICAL TERMINOLOGY FOR PHARMACY Flash Cards

Laressa Bethishou
Clark D. Kebodeaux

McGraw Hill LANGE®


MEDICAL TERMINOLOGY
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Flash Cards
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LANGE®

Lange® Medical Terminology for Pharmacy Flash Cards

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THROMBOSIS
THYROTOXICOSIS
TINEA
TINNITUS

TOXICITY
TACHYPNEA
URETHRITIS
URINALYSIS
URTICARIA
UVEITIS
VAGINITIS
VAGINOSIS
VASCULITIS
VASCULOPATHY
VASOCONSTRICTION
VASODILATION
VENO-OCCLUSIVE
VENTRICULAR
VERTIGO
VITILIGO
VULGARIS
VULVOVAGINIAL
XEROPHTHALMIA
XEROSTOMIA

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Introduction and Overview

Background and Introduction

Medical terminology is a language used by healthcare providers to describe anatomy and physiology of the human body, disease state processes, and procedures, treatments, and therapies for managing health. Medical terminology is used to standardize communication between healthcare providers, and document updates to patient health, diagnoses, and treatment. It is important that healthcare information is clearly and consistently shared and documented as patients transition through the healthcare system. Healthcare providers must have a strong knowledge of medical terminology so that they are able to understand updates to patient health, communicate to healthcare providers, and translate to a language that can easily be understood by patients.

Pharmacists provide care by optimizing medication therapy regimens. This requires a strong understanding of medication therapies, including mechanism of action, dosing and dose adjustments, drug interactions, proper administration, and adverse effects and precautions. Beyond that, pharmacists must understand and appreciate how the human body works, how disease states are diagnosed, clinical presentation for disease, and treatment options including but not limited to medication therapies. A strong understanding of medical terminology is essential for pharmacy students and pharmacists to provide patient care as a member of the healthcare team.

To best support pharmacy students in their journey towards becoming medication experts, this resource is closely aligned with the Top 300 Drug Cards. While medical terminology is a broad and expansive language, this resource will focus on the top medical terminology essential to a pharmacy student to best understand medication therapies.

How to Use This Resource

For each medical term, the Top 300 Medical Terminology Cards resource will include the medical term, the definition, word parts, pronunciation,

and clinical pearls. Cards can be filtered based on tags (i.e. administration cards, cardiology cards, infectious disease cards etc). Cards will link to the Top 300 Drugs and to other medical terms where appropriate and necessary to provide more information to students.

Significance of Clinical Pearls

Each medical terminology card will share clinical pearls which will provide important information about the medical term for pharmacy students. These clinical pearls may include pathophysiology, lab values and diagnosis criteria, clinical presentation, signs and symptoms, and treatment options. While the cards are intended to be as uniform as possible, medical terminology is an expansive language, as noted above. Therefore, the clinical pearls for each medical term may vary. It is important that students acknowledge information on the cards does not provide a comprehensive review of a complicated topic. Clinical pearls are facts about a medical term that are clinically relevant for a pharmacy student as they learn about medications and participate in their introductory experiential rotations.

Understanding Word Parts

Medical terms can frequently be broken down into word parts which include prefixes, root words, and suffixes. When learning medical terminology, an understanding of commonly used word parts can help students anticipate the meaning of a word, even if they have never been exposed to that word before. For example, a student who has learned that the prefix “hyper” means “high”, the root word “glycol” means sugar, and the suffix “emia” means “in the blood” can apply this learning to the word “hyperglycemia” to understand this medical term refers to high sugar in the blood. The next time any of these word parts are seen in another medical term, the student can apply their understanding of word parts to figure out the meaning of the word.

It is worth noting that not every medical term is constructed from word parts. Therefore, some cards will indicate that the term is a “non-constructed medical term”. Memorization of the definition is still important but the individual word parts will not be helpful in understanding other medical terms in this case.

Anatomy/Physiology and Administration Cards

Cards 1-5 include a list of anatomy/physiology and administration terms. Each of these cards will include the med term, the definition, the word parts, and pronunciation. These cards will help students understand how medical terminology is used in describing anatomy and physiology in the body as well as how medications are administered. Because these cards are description of location or administration, they do not have clinical pearls. Therefore, students will note that cards 1-5 are in a chart format, and contain more than one term per card. Please make sure you review these cards closely as the word parts used here will frequently appear throughout the Top 300 Medical Terminology Cards.

DRUG ADMINISTRATION TERMS (A-I)

Medical Term	Definition	Word Parts	Pronunciation
Buccal	A topical administration route in which medication is placed between the gums and cheek	**Root:** bucca: cheek **Suffix:** al: pertaining to	BUH-kl
Cutaneous	Pertaining to the skin	**Root:** cutane/o: skin **Suffix:** ous: pertaining to	kyoo-TAY-nee-uhs
Endotracheal	Applied through the trachea, using a tube to keep the airway open and administer medications	**Prefix:** endo: in, within **Root:** trachea: part of the airway system, extending from the larynx to the bronchial tubes **Suffix:** -al: pertaining to	en-doh-TRAY-kee-uhl
Enteral	Pertaining to, or passing through, the intestines	**Root-**enter/o: intestines **Suffix:** -al: pertaining to	EN-truhl
Intradermal	Within or into the skin	**Prefix:** intra-: within, into **Root:** derm/o: skin **Suffix:** -al: pertaining to	in-truh-DER-muhl
Intramuscular	Within or into the muscle	**Prefix:** intra -: within, into **Root:** muscul/o: muscle **Suffix:** -ar: pertaining to	in-truh-MUS-cue-lr
Intranasal	Within or into the nose	**Prefix:** intra-: within, into **Root:** nas/o: nose **Suffix:** -al: pertaining to	in-truh-NAY-zuhl
Intraocular	Within or into the eye	**Prefix:** intra-: within, into **Root:** ocul/o: eye **Suffix:** -ar: pertaining to	in-truh-AH-cue-lr
Intrathecal	Within or into the thecal sac	**Prefix:** intra-: within, into **Root:** theca: thecal sac **Suffix:** -al: pertaining to	in-truh-THEE-kuhl
Intravenous	Within or into a vein	**Prefix:** intra-: within, into **Root:** ven/o: vein **Suffix:** -ous: pertaining to	in-truh-VEY-nuhs

DRUG ADMINISTRATION TERMS (J-Z)

Medical Term	Definition	Word Parts	Pronunciation
Nasogastric	Involving a route to the stomach through the nose, often used in nutrition via a tube	**Prefix:** nas/o: nose **Root:** gastr/o: stomach **Suffix:** -ic: pertaining to	nay-zoh-GAH-strik
Neuraxial	Around the central nervous system, often referred to in anesthesia	**Prefix:** neur/o: nerve **Root:** axi/o: axis **Suffix:** -al: pertaining to	nuhr-AK-see-uhl
Ophthalmic	Pertaining to the eye, often used for ocular drug delivery	**Root:** opthalm/o: eye **Suffix:** -ic: pertaining to	of-THAL-mik
Parenteral	Route outside the intestines	**Prefix:** par-: abnormal **Root:** enter/o: intestines **Suffix:** -al: pertaining to	puh-REN-ter-uhl
Percutaneous	Absorbed or delivered through the skin	**Prefix:** per-: through **Root:** cutane/o: skin **Suffix:** -ous: pertaining to	per-cue-TAY-nee-us
Rectal	Affecting the rectum	**Root:** rect/o: rectum **Suffix:** -al: pertaining to	REK-tuhl
Subconjunctival	Occurring below the conjunctiva (lining of inner surface of the eyelid and the exposed portion of the eyeball)	**Prefix:** sub-: under, below **Root:** conjunctiv/o: conjunctiva (lines of eyelids) **Suffix:** -al: pertaining to	sub-con-junk-TIH-vul
Subcutaneous	Below the skin, or route of administration	**Prefix:** sub-: under, below **Root:** cutane/o: skin **Suffix:** -ous: pertaining to	sub-cue-TAY-nee-us
Sublingual	Administered under the tongue	**Prefix:** sub-: under, below **Root:** -lingu/o: tongue **Suffix:** -al: pertaining to	sub-LING-wal
Transdermal	Absorption through the skin	**Prefix:** trans-: across, through **Root:** derm/o: skin **Suffix:** -al: pertaining to	trans-DUR-muhl

ANATOMICAL MED TERMS (A-G)

Medical Term	Definition	Word Parts	Pronunciation
Atrioventricular	Located between atrium and ventricles of the heart	**Root:** atrio: atrium, ventriculo: ventricle **Suffix:** ar: pertaining to	ay-tree-oh-ven-TRIK-you-lr
Cardiovascular	Relating to heart and blood vessels	**Root:** cardi/o: heart, vascul/o: vessel **Suffix:** ar: pertaining to	car-dee-oh-VAS-kyuh-lr
Cerebrovascular	Relating to brain and blood vessels	**Root:** cerebr/o: cerebrum, vascul/o: vessel **Suffix:** ar: pertaining to	sur-ee-bro-VAS-kyuh-lr
Cochlear	Pertaining to the inner part of the ear	**Root:** cochle/o: inner part of the ear **Suffix:** ar: pertaining to	koh-KLEE-ur
Colorectal	Pertaining to the colon and the rectum	**Root:** col/o: colon, rect/o: rectum **Suffix:** al: pertaining to	Koh-loh-REK-tl
Endometrial	Lining of the uterus	**Prefix:** endo: in, within **Root:** metri/o: uterus **Suffix:** al: pertaining to	en-doh-MEE-tree-us
Enterohepatic	Circulation between the intestines and the liver	**Prefix:** enter/o: intestines **Root:** hepat/o: liver **Suffix:** -ic: pertaining to	en-teh-ROH-heh-pah-tik
Epidermal	Pertaining to the outermost layer of the skin	**Prefix:** epi: above, upon **Root:** derm: skin **Suffix:** al: pertaining to	eh-puh-DUR-muhl
Epidural	Pertaining to the area around the dura mater of the spinal cord	**Prefix:** epi: above, upon **Root:** dur/o: dura mater **Suffix:** al: pertaining to	eh-puh-DUR-uhl
Epigastric	Pertaining to the area above the stomach	**Prefix:** epi: above, upon **Root:** gastr/o: stomach **Suffix:** -ic: pertaining to	eh-puh-GAH-strik
Gastric	Pertaining to the stomach	**Root:** gastr/o: stomach **Suffix:** -ic: pertaining to	GAH-strik
Gastroesophageal	Pertaining to the stomach and esophagus	**Root:** gastr/o: stomach, esophag/o: esophagus **Suffix:** al: pertaining to	gah-stroh-eh-saw-FO-jee-uhl
Genitourinary	Related to the genital and urinary organs	**Root:** genit/o: genitals, urin/o: urine **Suffix:** ary: related to	jeh-nuh-toh-YUR-uh-neh-ree

ANATOMICAL MED TERMS (H-O)

Medical Term	Definition	Word Parts	Pronunciation
Hematologic	Pertaining to study of the blood	**Root:** hemat/o: blood **Suffix:** log/o: study,-ic: pertaining to	hee-muh-tuh-LAW-jik
Hepatic	Pertaining to the liver	**Root:** hepat/o: liver **Suffix:** -ic: pertaining to	huh-PAH-tik
Intracranial	Within the skull	**Prefix:** intra-: within, into **Root:** crani/o: skill **Suffix:** -al: pertaining to	in-truh-CRAY-nee-uhl
Lumen	Cavity of the tubular organ	Non-constructed med term	LOO-men
Lymphocyte	Type of white blood cell from lymphoid tissue	**Root:** lymph/o: lymph **Suffix:** -cyte: cell	LIM-fuh-cyte
Media	Refers to the media anatomical location, such as otitis media	Latin origin (middle)	MEH-dee-uh
Myocardial	Pertaining to the muscle of the heart	**Prefix:** my/o: muscle **Root:** cardi/o: heart **Suffix:** -al: pertaining to	my-oh-CAR-dee-uhl
Neoplasia	New tumor growth or formation	**Prefix:** neo-: new **Root:** -plasia: development, formation	nee-oh-PLAY-juh
Neoplasm	New tumor formation	**Prefix:** neo-: new **Root:** -plasm: formation	NEE-oh-plah-zim
Optic	Related to the eye	**Root:** opt/o: eye, vision **Suffix:** -ic: pertaining to	OP-tik
Oropharyngeal	Related to the pharynx and the mouth	**Prefix:** or/o: mouth **Root:** pharyng/o: throat (pharynx) **Suffix:** -al: pertaining to	or-oh-fuh-RIN-jeel
Ovarian	Pertaining to the ovary	**Root:** ovari/o: ovary **Suffix:** -ian: pertaining to	oh-VEH-ree-uhn

ANATOMICAL MED TERMS (P-Z)

Medical Term	Definition	Word Parts	Pronunciation
Pectoris	Location near the chest	**Root:** pector/o: chest	pec-TOR-is
Pedis	Describing the foot, often as an anatomical location of infection	**Root:** ped/o: foot	PEE-dis
Periocular	Surrounding the eye	**Prefix:** peri-: surrounding **Root:** ocul/o: eye **Suffix:** -ar: pertaining to	per-ee-OCK-you-lar
Pulmonary	Pertaining to the lung	**Root:** pulmon/o: lung **Suffix:** -ary: pertaining to	PUHL-muh-neh-ree
Perianal	Surrounding, or pertaining to, the anus	**Prefix:** peri-: surrounding **Root:** anal: anus	peh-ree-AY-nuhl
Perioral	Surrounding, or related to, the mouth	**Prefix:** peri-: surrounding **Root:** oral: mouth	peh-ree-OH-ruhl
Renal	Kidney, pertaining to	**Root:** renalis (Latin origin, plural): kidney	REE-nuhl
Retroperitoneal	Pertaining to the area behind the peritoneum	**Prefix:** retro: behind, posterior **Root:** peritoneum: lining of abdominal cavity and organs **Suffix:** al: pertaining to	reh-troh-peri-TOW-nee-um
Subdural	Pertaining to the area below the dura mater of the brain and spinal cord	**Prefix:** sub: below **Root:** dur/o: dura mater **Suffix:** al: pertaining to	sub-DUR-uhl
Supraventricular	Located above the ventricle of the heart, often referring to abnormal rhythm	**Prefix:** supra-: above, upper **Root:** ventricul/o: ventricle of heart **Suffix:** -ar: pertaining to	Sue-pruh-ven-TRIK-you-lr
Testicular	Relating to the testis	**Prefix:** test/o: testis **Root:** -ic: pertaining to **Suffix:** -ular: relating to	tes-TIK-you-lr
Urinary	Pertaining to urine	**Root:** Urin/o: urine **Suffix:** -ary: pertaining to	YOU-ruh-neh-ree
Vasomotor	Regulation of size of blood vessels	**Root:** vas/o: vessel; duct **Suffix:** -motor (movement)	VAH-sow-moh-ter
Venous	Pertaining to the veins	**Root:** ven/o: vain **Suffix:** -ous: pertaining to	VEE-nuhs

ABSCESS

Tags: Infectious Disease

Definition: A localized collection of pus surrounded by inflamed tissue

Pronunciation: AB-sess

Prefix	Root	Suffix
	abscess (Latin origin)	

Clinical Pearls:

- Treatment of infections with an abscess likely requires incision and drainage of the abscess.
- The acidic pH of an abscess can reduce antibiotic efficacy.
- Antibiotic selection and dosing should be optimized to penetrate abscess.

ACIDOSIS

Tags: Respiratory, Metabolic, Endocrinology

Definition:	The condition of abnormal acid in the body
Pronunciation:	ah-sid-OH-sis

Prefix	Root	Suffix
	acid (Latin origin)	-osis: condition, abnormal state

Clinical Pearls:

- The lungs play an important role in regulating acid-base homeostasis by regulating respiration and increasing respiratory rate to remove excess carbon dioxide. The normal pH of blood is 7.4, with a range between 7.35 and 7.45. A pH less than 7.35 indicates acidosis.
- The kidneys also play an important role in regulating acid-base homeostasis by regulating excretion and reabsorption of bicarbonate.
- In metabolic acidosis, patients have a decrease in pH due to a loss of bicarbonate. This can be due to gastrointestinal bicarbonate loss, such as with vomiting or diarrhea, or may be attributed to medications including NSAIDs (such as ibuprofen), ACE inhibitors (such as lisinopril) and diuretics.
- In respiratory acidosis, patients have a decrease in pH due to an increase in $Paco_2$, which can be attributed to airway obstruction, central nervous system disease, and toxins.
- Acidosis may develop as a result of organ failure, chronic disease states, or as an adverse effect of medications such as metformin, canagliflozin, and entecavir.
- Treatment of acidosis will require addressing underlying causes, in addition to correcting pH and electrolyte disturbances.
- Metabolic disturbances are corrected by respiratory compensation whereas respiratory disturbances are corrected by metabolic compensation.

ADENOCARCINOMA

Tags: Oncology

Definition: A cancer that develops in glandular tissues

Pronunciation: ad-eh-noh-car-sih-NOH-ma

Prefix	Root	Suffix
	aden/o: gland	-oma: mass, tumor, fluid collection
	carcino/o: cancerous	

Clinical Pearls:

- Esophageal adenocarcinoma may develop as a complication of gastroesophageal reflux disease and is more common in those with chronic symptoms.

ADENOMA

Tags: Oncology

Definition: A non-cancerous tumor in glandular tissues

Pronunciation: ad-eh-NOH-ma

Prefix	Root	Suffix
	aden/o: gland	-oma: mass, tumor, fluid collection

Clinical Pearls:

- Thyroid adenoma may develop as a rare adverse effect of potassium iodide.

AGRANULOCYTOSIS

Tags: Immunology

Definition: A deficiency of white blood cells in the blood

Pronunciation: ay-gran-you-lo-sigh-TOH-sis

Prefix	Root	Suffix
a-: no, not, without	granul/o: granules, cyt/o: cell	-osis: condition, abnormal state

Clinical Pearls:

- Agranulocytosis is rare but serious condition in which the body does not make enough white blood cells.
- The terms agranulocytosis, granulocytopenia, and neutropenia are often used interchangeably.
- It can be caused by autoimmune disorders, infection, chemotherapy, or medications, including clozapine, colchicine, ezetimibe, and hydralazine.
- The Clozapine Risk Evaluation and Mitigation Strategy (REMS) Program is required for prescribers, pharmacies, and patients due to the risk of agranulocytosis.
- Clinical presentation includes fever, increased risk of infection, sore throat, malaise, chills, and a neutrophil count < 500 cells/mm^3 (0.5×10^9/)L.
- When caused by medications, onset is typically delayed with symptoms occurring about a month after drug initiation.
- Treatment can include antibiotics if infection is present, management of autoimmune disorders, and medications to stimulate production of white blood cells such as filgrastim or pegfilgrastim.

AKATHISIA

Tags: Psychology, Neurology

Definition:	Inability to sit still
Pronunciation:	ah-kah-thee-ZEE-ah

Prefix	Root	Suffix
	non-constructed medical term	

Clinical Pearls:

- Akathisia is a movement disorder that typically presents as feelings of restlessness and a compulsion to remain on constant motion, such as pacing, shuffling, or tapping.
- Akathisia can occur early in antipsychotic treatment but can be chronic if not addressed. Common examples include antipsychotic medications including aripiprazole, lurasidone, olanzapine, risperidone, and vilazodone.
- Management strategies include lowering dosage, if appropriate, addition of low-dose beta blocker, or switching to agents with lower risk of akathisia, such as quetiapine and clozapine.
- Risk is greater in patients on multiple antipsychotic medications or when dosage is increased rapidly.

ALOPECIA

Tags: Dermatology

Definition:	Partial or complete hair loss
Pronunciation:	al-oh-PEE-shuh

Prefix	Root	Suffix
	non-constructed medical term	

Clinical Pearls:

- Alopecia, characterized by thinning hair or hair loss, can be idiopathic or may be attributed to genetic factors, nutritional deficiencies, certain disease states, or infections.
- Alopecia can also be an adverse event of medications including amiodarone, methotrexate, and tacrolimus.
- Treatment should identify and address underlying causes, and may include hormonal therapies, topical minoxidil, and nutritional supplements.
- Dutasteride and finasteride can be used in treatment of alopecia in males.

AMENORRHEA

Tags: Women's Health

Definition: Absence of menstruation

Pronunciation: ay-men-oh-REE-ah

Prefix	Root	Suffix
a-: no, not, without	men/o: menstruation	-rrhea: flow, discharge

Clinical Pearls:

- Amenorrhea can be caused by anatomical causes, reproductive organ abnormalities, or hormone disruption.
- Treatment should address the underlying cause and may include hormone therapy, such as progesterone and medroxyprogesterone.

AMNESIA

Tags: Neurology

Definition: Loss of memory

Pronunciation: Am-NEE-zhuh

Prefix	Root	Suffix
a-: no, not, without	mneme: memory	esia: condition

Clinical Pearls:

- Anterograde amnesia refers to difficulty with retaining new information whereas retrograde amnesia refers to loss of memories acquired before the onset of amnesia.
- Amnesia can be caused by medications include benzodiazepines or other medications including pramipexole.
- Medication related amnesia, such as that caused by benzodiazepines (including alprazolam, or lorazepam) can be worsened with alcohol use.

ANALGESIA

Tags: Neurology

Definition: Absence of or relief from pain

Pronunciation: an-al-JEE-zee-ah

Prefix	Root	Suffix
an-: no, not, withoutno, not, without	algo: pain	esia: condition

Clinical Pearls:

- Analgesia can include pharmacologic and non-pharmacologic approaches to acute and chronic pain management.
- Pharmacologic analgesia may include opioid (such as morphine) and non-opioid medications for mild, moderate, or severe pain management.
- Selection of appropriate agents will depend on the indication, severity of pain, neuropathic vs. nociceptive pain, desired onset, and duration of action.
- Pharmacists should be knowledgeable about proper administration, drug interactions, adverse effects, and strategies for multi-modal pain management to limit unnecessary opioid use to reduce inappropriate use.

ANAPHYLAXIS

Tags: Immunology

Definition: A severe allergic reaction, an acute hypersensitivity reaction

Pronunciation: ah-nuh-fuh-LAX-us

Prefix	Root	Suffix
an/a-: no, not, without	-phylaxis: protection	

Clinical Pearls:

- An acute, life threatening allergic reaction which may be attributed to food, allergen, or medication hypersensitivity.
- Symptoms can include tightness of the throat and chest, shortness of breath, flushing, urticaria, pruritis, and angioedema.
- Epinephrine is the treatment of choice and should be administered intramuscularly in the anterolateral thigh through clothing if necessary.
- The offending agent should be discontinued immediately.
- Desensitization protocols are used to reduce the risk of reactions for patients who have previously experienced anaphylaxis to a medication.

ANEMIA

Tags: Hematology

Definition: A deficiency of red blood cells or hemoglobin

Pronunciation: ah-nee-MEE-ah

Prefix	Root	Suffix
an-: no, not, without		-emia: blood, condition of blood

Clinical Pearls:

- Anemia can be due to blood loss, inflammation, renal disease, or deficiencies in iron, folic acid, and vitamin B-12.
- Anemia is defied by a hemoglobin of < 13 g/dL in men or < 12 g/dL in women.
- Reduced oxygen carrying capacity of the blood results in symptoms including tachycardia, dizziness, lightheadedness, dyspnea, fatigue, and weakness.
- Treatment will vary depending on the underlying cause and clinical presentation; patients with iron deficiency anemia can be treated with oral or parenteral iron supplementation.

ANEURYSM

Tags: Hematology

Definition: An abnormal dilation of a blood vessel due to wall weakening

Pronunciation: an-you-RIZ-um

Prefix	Root	Suffix
	non-constructed medical term	

Clinical Pearls:

- Aneurysms can occur anywhere but commonly present in the heart, the brain, and the intestines. Rupture of an aneurysm is a medical emergency and can cause hemorrhaging.
- An aneurysm is a contraindication to use of specific medications, such as hydralazine.

ANGINA

Tags: Cardiology

Definition: Chest pain caused by decreased blood flow or oxygen to the heart

Pronunciation: an-JIH-nuh

Prefix	Root	Suffix
	angina: to choke or throttle (Latin origin)	

Clinical Pearls:

- Angina may be caused by coronary artery disease, high blood pressure or cholesterol, or medications including maraviroc, nebivolol, and sildenafil.
- Stable angina occurs with physical exertion and is relieved with rest. Unstable angina is less predictable, occurs at rest, and requires emergent medical attention. Symptoms may be described as squeezing, crushing or tightness in the chest.
- Treatment of chronic angina includes isosorbide mononitrate, metoprolol, and ranolazine.
- Acute angina should be treated with sublingual nitroglycerin and may require emergent medical attention if symptoms do not resolve.
- Angina is a contraindication to the use of medications stimulant medications (including methylphenidate).

ANGIOEDEMA

Tags: Immunology

Definition:	Swelling of the deeper layers of the skin
Pronunciation:	an-gee-oh-ed-EE-mah

Prefix	Root	Suffix
	angi/o-: blood vessel	-edema: swelling

Clinical Pearls:

- Angioedema can be caused by allergic reactions, medications, or genetic conditions. Hallmark symptoms include swelling, redness or rash, and difficulty breathing.
- Antihistamines and steroids can help with symptoms, although angioedema affecting the airway will require emergent medical attention.
- Angioedema can be an adverse effect of medications including lisinopril, losartan, and valsartan among others. History of angioedema is a contraindication to the use of medications including lisinopril, ramipril, and quinapril.
- If switching from an ACE inhibitor to sacubitril/valsartan, allow a washout period of 36 hours between administration of the two drugs due to the risk of angioedema.

ANHIDROSIS

Tags: Endocrinology, Dermatology

Definition: Absence of sweating

Pronunciation: an-high-DRO-sis

Prefix	Root	Suffix
an-: no, not, without	hydr: water	-osis: condition, abnormal state

Clinical Pearls:

- Anhidrosis may develop as a symptom of another disease, such as diabetes, or be caused by medications such as benztropine.
- The lack of sweating may be generalized or in a localized area and can affect body temperature regulation. Treatment options are limited and vary depending on the underlying cause.

ANOREXIA

Tags: Metabolic

Definition: An eating disorder characterized by a lack or loss of appetite

Pronunciation: an-oh-REK-ee-ah

Prefix	Root	Suffix
an-: no, not, without	orexia: appetite	

Clinical Pearls:

- Anorexia can be caused by environmental factors, such as stress and psychological issues, but may also be an adverse event of medications such as chlorthalidone, guanfacine, and digoxin. Symptoms of anorexia include fear of eating and gaining weight, low body weight, weakness, lethargy.
- Anorexia can lead to electrolyte abnormalities, amenorrhea, metabolic acidosis, bradycardia, and thrombocytopenia.
- Treatment involves psychotherapy which seeks to restore and maintain healthy body weight and eating habits.
- Bupropion is contraindicated in patients with a history of anorexia or bulimia, due to increased risk of seizures.

ANTICHOLINERGIC

Tags: Neurology

Definition:	Inhibiting the action of acetylcholine
Pronunciation:	an-tee-koh-luh-NUR-jik

Prefix	Root	Suffix
anti-: against	acetylcholine: neurotransmitter in the brain	-ic: pertaining to

Clinical Pearls:

- Anticholinergic medications act against acetylcholine receptors in the parasympathetic nervous system. This is the branch of the autonomic nervous system which slows heart rate, causes smooth muscle contraction, dilates blood vessels, and increases bodily secretions.
- Anticholinergic medications can be used for management of multiple disease states, including asthma and chronic obstructive pulmonary disease, depression, urinary incontinence, and Parkinson's disease.
- Adverse effects associated with this class of medications include constipation, urinary retention, dry eyes, dry mouth and confusion.
- Anticholinergic medications, such as benztropine, diphenhydramine, and promethazine should be avoided in the elderly due to increased susceptibility to adverse effects, including cognitive impairment.

ANTICOAGULATION

Tags: Cardiology

Definition:	Prevent the clotting of blood
Pronunciation:	an-tee-coh-AG-you-lay-shun

Prefix	Root	Suffix
anti-: against	coagulate: clot	-ion: process

Clinical Pearls:

- Anticoagulation medications, commonly known as blood thinners, may be prescribed to prevent the risk of blood clots, heart attack or stroke.
- Signs of bleeding may include blood in the urine or stool, dark or tarry stools, coughing up or vomiting blood, bruising which worsens or does not go away, and prolonged nosebleeds.
- Patients prescribed anticoagulation medications, such as apixaban, enoxaparin, or warfarin should be counseled on proper administration, signs of bleeding, when to seek urgent or emergent medical attention, and common drug interactions.
- Patients on anticoagulation should notify all healthcare providers as they may need to hold their medication before any medical procedures.
- Pharmacists should screen medication lists for drug interactions and medications which may increase the risk of bleeding, such as ibuprofen, aspirin, and some over-the-counter (OTC) medications and supplements.

ANTIEMETIC

Tags: Neurology, Gastrointestinal

Definition:	Preventing nausea and vomiting
Pronunciation:	an-tee-eh-MEH-tik

Prefix	Root	Suffix
anti-: against	emesis: vomiting	-ic: pertaining to

Clinical Pearls:

- Common causes of nausea and vomiting can include headache, pregnancy, chemotherapy, and gastroenteritis.
- Antiemetic medications can be used to treat or prevent nausea and vomiting, regardless of the cause. Patients at high risk for nausea and vomiting, such as those receiving chemotherapy, may require prophylactic doses of antiemetic medications.
- Appropriate selection of medication should consider safety, efficacy, adverse events, cost, and drug interactions. Example medications that can be used for treatment of nausea and vomiting include aprepitant, ondansetron, prochlorperazine, and promethazine.
- Patients should be counseled on proper administration based on medication route and formulation.
- Anti-emetics such as prochlorperazine, and promethazine that act on dopamine receptors should be avoided in patients with Parkinson's disease.

ANTIHYPERLIPIDEMIC

Tags: Cardiology

Definition:	Preventing elevated lipids in the blood
Pronunciation:	an-tee-high-pur-lip-id-EE-mik

Prefix	Root	Suffix
anti-: against	lipid: fat	emia: blood,-ic: pertaining to
hyper: excessive, above		

Clinical Pearls:

- A class of medications which lowers lipid levels in the blood; these medications may lower triglycerides or low-density lipoprotein (LDL) levels, or increase high density lipoprotein (HDL) levels.
- Selection of agent may depend on desired outcome, efficacy, safety, and adverse events including stain medications as well as ezetimibe, fenofibrate, gemfibrozil, and niacin.
- Antihyperlipidemic medications may have contraindications to use, including active liver disease, pregnancy, and nursing. Pharmacists should be aware of contraindications, warnings, and adverse effects for specific medications.

ANTINEOPLASTIC

Tags: Oncology

Definition:	Preventing the growth of tumor or cancer cells
Pronunciation:	an-tee-nee-oh-PLAH-stik

Prefix	Root	Suffix
anti-: against	plast: growth, formation	-ic: pertaining to
neo: new		

Clinical Pearls:

- Antineoplastics are a class of medications used to treat cancer.
- The pharmacist's role includes ensuring appropriate selection and dosing of agents, educating patients on adverse events, and providing prophylactic therapy to prevent medication induced reactions.
- Adverse events will vary depending on the antineoplastic agent being used but common reactions include nausea and vomiting, constipation, diarrhea, changes to appetite, hair loss, and increased risk of infection.

ANTIPLATELET

Tags: Cardiology, Hematology

Definition: Preventing blood clotting through inhibition of platelet aggregation

Pronunciation: an-tee-PLAIT-luht

Prefix	Root	Suffix
anti-: against	platelet: blood particle which plays a role in clotting	

Clinical Pearls:

- Antiplatelet medications may be prescribed to prevent the risk of blood clots following stroke or heart attack.
- Patients prescribed antiplatelet medications, such as clopidogrel, prasugrel, or ticagrelor should be counseled on proper administration, signs of bleeding, when to seek urgent or emergent medical attention, and common drug interactions.
- Signs of bleeding may include blood in the urine or stool, dark or tarry stools, coughing up or vomiting blood, bruising which worsens or does not go away, and prolonged nosebleeds
- Patients on antiplatelets should notify all healthcare providers and may need to hold their medication before any medical procedures.
- Pharmacists should screen medication lists for drug interactions and medications which may increase the risk of bleeding, such as ibuprofen and aspirin.
- Some patients may be required to take both aspirin and an antiplatelet medication, which is known as dual anti-platelet therapy (DAPT).

ANTIPRURITIC

Tags: Immunology, Dermatology

Definition: Prevent or relieve itching

Pronunciation: an-tee-proo-RIH-tik

Prefix	Root	Suffix
anti-: against	prurit: itching	-ic: pertaining to

Clinical Pearls:

- Corticosteroid medications, such as clobetasol, fluticasone, hydrocortisone, mometasone, and triamcinolone have antipruritic properties.
- Diphenhydramine and hydroxyzine can reduce itching by blocking effects of endogenously released histamine.
- Pruritis is a symptom of dermatologic conditions, such as atopic dermatitis.

ANTISPASMODIC

Tags: Genitourinary, Neurology

Definition:	Preventing or relieving sudden muscle contracting
Pronunciation:	an-tee-spaz-MAW-dik

Prefix	Root	Suffix
anti-: against	spasmod/o: sudden muscle contraction	-ic: pertaining to

Clinical Pearls:

- Urinary antispasmodic medications, such as darifenacin, oxybutynin, and solifenacin are used to treat overactive bladder.
- Medications which cause muscle relaxation may case sedation. Patients should be advised against activities which require alertness.
- Pharmacists should screen medication lists for drug interactions, including renal and hepatic dose adjustments to medications when appropriate.

ANURIA

Tags: Genitourinary

Definition: A failure to produce urine

Pronunciation: uh-NYUR-ee-uh

Prefix	Root	Suffix
an-: no, not, without		-uria: urination, condition of urine

Clinical Pearls:

- Anuria can be caused by damage to the kidneys, chronic disease states such as diabetes hypertension, and heart failure, or obstruction. A failure to produce urine for 12 or more hours may be a sign of renal failure.
- Treatment will depend on the underlying cause but may include hemodialysis or stent placement.
- Anuria is a contraindication to the use of some medications, including benazepril, chlorthalidone, furosemide, spironolactone, torsemide and tolvaptan.

APHASIA

Tags: Neurology

Definition: An inability to understand or express speech

Pronunciation: uh-FEY-zee-uh

Prefix	Root	Suffix
a-: no, not, without	phasia: speech	

Clinical Pearls:

- Aphasia may present as a symptom of stroke, dementia, or neurologic disease that is characterized by difficulty expressing and/or comprehending speech.
- Treatment is dependent on the cause, and may include management of comorbidities, addressing mental health, and providing support and education.

APLASIA

Tags: Miscellaneous

Definition:	Failure of organ or tissue to develop properly
Pronunciation:	uh-PLAY-zhuh

Prefix	Root	Suffix
a-: no, not, without	plasia: formation, growth	

Clinical Pearls:

- Pure red cell aplasia is an adverse effect of medications including epoetin and darbepoetin.
- Aplastic anemia is a rare and serious disorder, caused by damage to the stem cells, where the body does not properly produce blood cells.

APNEA

Tags: Respiratory

Definition: A temporary cessation of breathing

Pronunciation: ap-NEE-uh

Prefix	Root	Suffix
a-: no, not, without	pnea: breathing	

Clinical Pearls:

- Apnea may be attributed to underlying disease, airway obstruction, respiratory impairment, or may be an adverse effect of medications including phenobarbital.
- Treatment of apnea may include addressing the underlying condition, weight loss, surgery, and use of a continuous positive airway pressure (CPAP) machine. Medications like modafinil can help with wakefulness for patients who excessive sleepiness attributed to obstructive sleep apnea.
- Patients with apnea should avoid central nervous system depressants, like alcohol and benzodiazepines (such as diazepam). Apnea is a contraindication to the use of benzodiazepine medications.

ARRHYTHMIA

Tags: Cardiology

Definition: Abnormal heart rate or rhythm

Pronunciation: uh-rith-MEE-uh

Prefix	Root	Suffix
a-: no, not, without	rhythm/o: regular repeated pattern	-ia: condition

Clinical Pearls:

- The terms arrhythmia and dysrhythmia are often used interchangeably. Arrhythmia may be caused by cardiovascular disease, ischemia, congenital defects, underlying disease states, electrolyte abnormalities, or may be an adverse effect of medications.
- Symptoms may include dizziness, chest pain, shortness of breath, fast or slow heartbeats, and palpitations. Common arrhythmias include atrial fibrillation, bradyarrhythmias, tachyarrhythmias, ventricular and supraventricular arrhythmias.
- Electrocardiogram (ECG) results can help diagnose arrhythmias by evaluating heart rate and rhythm.
- Abnormal levels of potassium and magnesium may precipitate or worsen arrhythmias.
- Arrhythmia may be an adverse effect of some medications, including moxifloxacin, ondansetron, and verapamil.
- Treatment may include cardioversion, placement of pacemakers, or medications which control heart rate and rhythm. Patients with arrhythmia may require anticoagulation to prevent risk of ischemic stroke.

ARTERIOSCLEROSIS

Tags: Cardiology

Definition:	Hardening of the artery walls
Pronunciation:	ar-teer-ee-oh-skluh-ROH-sis

Prefix	Root	Suffix
	arterio: artery	sclerosis: hardening

Clinical Pearls:

- Atherosclerosis is a type of arteriosclerosis, caused by the buildup of fat in the artery walls.
- The terms atherosclerosis and arteriosclerosis are often used interchangeably. Both lead to a decrease in blood flow and risk of peripheral artery disease, heart attack, and stroke. Patient risk factors include hypertension, hypercholesterolemia, obesity, and diabetes.
- Certain medications including eletriptan, rizatriptan, and sumatriptan should be used with caution in patients with arteriosclerosis.
- Management includes diet, exercise, managing comorbidities, and medications like atorvastatin, gemfibrozil, lovastatin, niacin, and simvastatin.

ARTHRALGIA

Tags: Musculoskeletal

Definition: Joint pain

Pronunciation: aar-THRAL-gee-uh

Prefix	Root	Suffix
	arthro: joint	-algia: pain

Clinical Pearls:

- Arthralgia may be caused by injury, disease, or as a rare adverse effect of medications and immunizations, such as the HPV, MMR or pneumococcal vaccines.
- Arthralgia may also be a sign of rhabdomyolysis and is a monitoring parameter for toxicity in patients taking cholesterol medications like atorvastatin, ezetimibe, fenofibrate, gemfibrozil, and niacin.
- Treatment includes rest, stretching and exercise, and over-the-counter (OTC) pain medications.

ARTHRITIS

Tags: Musculoskeletal

Definition:	Inflammation of joints
Pronunciation:	aar-THRY-tis

Prefix	Root	Suffix
	arthr: joint	-itis: inflammation

Clinical Pearls:

- Arthritis is typically categorized into osteoarthritis (OA) or rheumatoid arthritis (RA). Other types of arthritis include psoriatic arthritis, infectious arthritis, and gouty arthritis.
- OA is characterized by cartilage destruction, decreased function and mobility, and pain and risk factors include age, genetics, hormone levels, and obesity.
- Joints in the knees, hips, and hands are commonly affected in OA and RA.
- Non-pharmacologic treatment options include weight loss, exercise, and surgery.
- Treatment focuses on managing pain and inflammation and includes acetaminophen, celecoxib, and ibuprofen. Topical formulations like diclofenac can be used to minimize systematic adverse effects in OA.
- RA is an autoimmune disorder characterized by inflammation and destruction of bone, cartilage, and joints.
- Conventional and biologic disease modifying antirheumatic drugs (DMARD) should be initiated in RA within 3 months of diagnosis to slow the progression of disease. Steroids, analgesics, and NSAIDs can be used as adjunctive treatment.
- Pharmacists should be knowledgeable on specific agents, proper administration, and adverse effects of each class of medications for RA.

ASCITES

Tags: Gastrointestinal

Definition: Abnormal fluid accumulation in the abdomen

Pronunciation: uh-SY-teez

Prefix	Root	Suffix
	non-constructed medical term	

Clinical Pearls:

- Ascites is most commonly due to liver disease and cirrhosis of the liver, although it may also be an adverse effect of medications, including rifaximin.
- Symptoms include dyspnea, abdominal pain, swelling, nausea and vomiting, and risk of spontaneous bacterial peritonitis, an infection of the fluid.
- Treatment of ascites includes sodium restriction, paracentesis, diuretic therapy with furosemide and spironolactone, transjugular intrahepatic portosystemic shunt (**TIPS**) procedure, and liver transplantation.
- Some medications, including lamotrigine and methotrexate, require dose adjustment in ascites due to decreased elimination.

ASEPTIC

Tags: Immunology

Definition: Free from infection or contamination

Pronunciation: ay-SEP-tik

Prefix	Root	Suffix
a-: no, not, without	sepsis: putrefy, decay, rot	-ic: pertaining to

Clinical Pearls:

- Aseptic techniques are a set of best practices applied by healthcare workers to prevent the transfer of germs.
- Aseptic techniques are crucial in any procedure where introduction of contamination can be detrimental to the health of the patient, including surgeries, wound care, compounding of intravenous medications, and administering injections.

ASPLENIA

Tags: Gastrointestinal

Definition:	The condition of being without a spleen
Pronunciation:	ay-SPLEE-nee-uh

Prefix	Root	Suffix
a-: no, not, without	splen: spleen	-ia: condition

Clinical Pearls:

- Asplenia may be congenital, caused by trauma or surgery, or secondary to diseases including sickle cell anemia.
- Asplenia is associated with increased risk of serious infection. It is critical that patients with asplenia receive appropriate vaccines to reduce their risk.
- Vaccines indicated for patients with asplenia include influenza, Tdap, Hib, pneumococcal, meningococcal, MMR, varicella, and zoster vaccines among others.

ASTHENIA

Tags: Miscellaneous

Definition:	The condition of being without strength or energy
Pronunciation:	ahs-THEE-nee-uh

Prefix	Root	Suffix
a-: no, not, without	sthenos: strength, power	-ia: condition

Clinical Pearls:

- Asthenia describes a condition of extreme weakness and lack of energy, which may be caused by anxiety and depression, aging, chronic disease, a sedentary lifestyle, or nutritional deficiencies.
- Asthenia is a common adverse effect of medications, including metformin, olanzapine, paroxetine, terazosin, and some chemotherapy agents.
- Symptoms include fatigue, lack of energy, and loss of strength.
- Myasthenia gravis describes a life-threatening condition characterized by weakness of voluntary muscles. There is no cure, and treatment focuses on relieving symptoms of muscle weakness, double vision, and difficulties with speech and swallowing.

ASYSTOLE

Tags: Cardiology

Definition:	The absence of contractions in the heart
Pronunciation:	ay-SYS-tuh-lee

Prefix	Root	Suffix
a-: no, not, without	systole: contraction	

Clinical Pearls:

- Asystole is a serious form of cardiac arrest that occurs when there is no electrical activity, and it appears as a flat line on the electrocardiogram (ECG).
- Treatment includes CPR, providing airway support, and IV medications. Epinephrine is the drug of choice for treatment of asystole.
- Successful treatment depends largely on identifying the underlying cause, and asystole is often not treatable.
- Asystole can be a rare but serious adverse effect of certain medications, like atropine and verapamil.

ATAXIA

Tags: Neurology

Definition: Loss of muscle control, lack of coordination of voluntary body movements

Pronunciation: uh-TAK-see-uh

Prefix	Root	Suffix
a-: no, not, without	taxis: order	

Clinical Pearls:

- Ataxia can be caused by alcohol, medications, stroke, tumors, or underlying diseases, such as cerebral palsy and multiple sclerosis.
- Symptoms include poor coordination, difficulty with speech and swallowing, unsteady gait, nystagmus, and difficulty with fine motor coordination.
- Medications that can cause ataxia include benzodiazepines (alprazolam, diazepam), lacosamide, and anticonvulsants (phenobarbital and phenytoin).
- Treatment may include non-pharmacological treatments including physical and occupational therapy, use of a walker or cane, and addressing the underlying condition.

ATHEROSCLEROTIC

Tags: Cardiology

Definition:	Hardening of the artery walls due to buildup of plaque
Pronunciation:	ah-thro-sklr-OH-sis

Prefix	Root	Suffix
	athero: plaque, fatty deposits	sclerosis: hardening

Clinical Pearls:

- Atherosclerosis is caused by a buildup of fat and cholesterol which leads to hardening of the artery walls.
- Atherosclerosis can affect the heart and blood vessels throughout the body, increasing the risk for stroke, heart attack, coronary artery disease, and peripheral artery disease (PAD).
- Risk factors include hypertension, high cholesterol, smoking, obesity, diabetes, unhealthy diet, lack of exercise, and stress.
- Symptoms may depend on which arteries are blocked and the extent of the blockage. Cardiac symptoms may include chest pain and shortness of breath. Central nervous system (CNS) symptoms may include headache, difficulty with vision and speech, and trouble moving the arms, legs and facial muscles.
- Treatment of atherosclerosis involves risk modification and may include cholesterol-reducing medications, such as statin medications (atorvastatin and simvastatin).

ATROPHY

Tags: Musculoskeletal

Definition:	Wasting away
Pronunciation:	ah-TRUH-fee

Prefix	Root	Suffix
a-: no, not, without	trophy: food, nourishment	

Clinical Pearls:

- Atrophy refers to the wasting away of muscles, organs, or tissues and can have numerous causes that include aging, lack of use, and disease. Skin atrophy can be caused by steroids, including dexamethasone, methylprednisone, or prednisone.
- Treatment involves addressing the underlying cause, when possible, as well as managing symptoms.
- Vaginal atrophy is a common cause of vaginitis that can be caused by changes in hormone levels and involves dryness, itching, and inflammation. Treatment includes lubricants, moisturizers, and hormone therapy such as estradiol.
- Muscular atrophy can be caused by a lack of physical activity, malnutrition, and conditions that severely limit mobility.

AUTOIMMUNE

Tags: Immunology

Definition: An immune response against one's own healthy body tissue

Pronunciation: aa-tow-uh-MYOON

Prefix	Root	Suffix
auto: self, own	immune: immunity	

Clinical Pearls:

- In autoimmune disorders, the body's immune system produces antibodies which are unable to differentiate self from non-self and can attack otherwise healthy body tissue.
- Treatment involves reducing the activity of the immune system by using immunosuppressant medications like steroids (such as prednisone).
- Examples of autoimmune disorders include lupus, multiple sclerosis, rheumatoid arthritis, Hashimoto's thyroiditis, and inflammatory bowel diseases.

ANTIPYRETIC

Tags: Immunology

Definition:	Preventing or relieving fever
Pronunciation:	an-tee-pie-RHE-tik

Prefix	Root	Suffix
anti-: against	pyr: fire, fever	etic: pertaining to

Clinical Pearls:

- Normal body temperature is between 98 and 98.6°F. A fever is a temperature above the normal range.
- Antipyretic medications, which include acetaminophen, aspirin, ibuprofen, and naproxen, can be given to reduce fever in adults.
- Acetaminophen and ibuprofen can be given to reduce fever in children. Careful consideration should be given to the age and weight of the child to determine appropriate agent and dosing.
- Pharmacists should counsel patients on maximum daily dosages to avoid toxicity. Patients should be advised to use caution with other medications, like combination of cough and cold products that may contain acetaminophen or ibuprofen as an active ingredient to avoid unintentional overdose.

ANESTHESIA

Tags: Neurology

Definition:	Producing a loss of sensation, including pain
Pronunciation:	an-es-THEE-zhuh

Prefix	Root	Suffix
an-: no, not, without	esthesia: sensation	

Clinical Pearls:

- Anesthesia is a reversible and controlled process in which a medication, or a combination of medications, is administered prior to a procedure to produce loss of sensation and pain.
- Anesthesia may be local or systemic, and can be administered by inhalation, intravenous injection, or via the spinal or epidural route.
- Patients receiving spinal or epidural anesthesia should not receive anticoagulation due to an increased risk of hematoma.
- Common effects of anesthesia include sedation, pain relief, unconsciousness, muscle relaxation, amnesia, and nausea and vomiting.
- Patients may be given an antiemetic, such as ondansetron, prior to anesthesia to reduce post-operative nausea and vomiting.

ANOSMIA

Tags: Neurology

Definition: A partial or complete loss of sense of smell

Pronunciation: uh-NOZ-mee-uh

Prefix	Root	Suffix
an-: no, not, without	osmia: smell	

Clinical Pearls:

- Partial or permanent loss of smell can be caused by medications, colds and allergies, or nasal blockage.
- Anosmia is also a possible symptom of the novel coronavirus.
- Inhaled zinc can cause permanent anosmia and should be avoided due to this side effect.
- Inhaled corticosteroids may be used to treat loss of smell associated with nasal polyps and blockage.

BACTERICIDAL

Tags: Infectious Disease

Definition:	Substance or medication which kills bacteria
Pronunciation:	bak-TEE-reh-sy-duhl

Prefix	Root	Suffix
	bacteri/o: bacteria	cide: killing
		-al: pertaining to

Clinical Pearls:

- Medications, disinfectants, and antiseptics with bactericidal activity will kill bacteria.
- Some medications, such as chlorhexidine and topical clindamycin, may be bactericidal or bacteriostatic depending on their concentration.
- Bactericidal and bacteriostatic agents may be equally efficacious in treating infections. Selection of the agent depends on the organism, infection type, and patient-specific characteristics.
- Antibiotics with bactericidal activity include aminoglycosides, beta-lactams, carbapenems, cephalosporins, fluoroquinolones, daptomycin, metronidazole, nitrofurantoin, and vancomycin among others.

BACTERIOSTATIC

Tags: Infectious Disease

Definition:	Substance or medication which stops bacterial growth
Pronunciation:	bak-TEE-ree-uh-stah-tik

Prefix	Root	Suffix
	bacteri/o: bacteria	static: lack of movement or growth

Clinical Pearls:

- Medications, disinfectants, and antiseptics with bacteriostatic activity will inhibit growth.
- Some medications, such as chlorhexidine and topical clindamycin, may be bactericidal or bacteriostatic depending on their concentration.
- Bactericidal and bacteriostatic agents may be equally efficacious in treating infections. Selection of the agent depends on the organism, infection type, and patient-specific characteristics.
- Antibiotics with bacteriostatic activity include tetracyclines, macrolides, clindamycin, trimethoprim/sulfamethoxazole, and linezolid. Other Bacteriostatic drugs, such as the tetracyclines, may interfere with the bactericidal effect of penicillin.

BENIGN

Tags: Oncology, Endocrinology

Definition: A condition, often referring to a growth or tumor that is not cancerous

Pronunciation: buh-NINE

Prefix	Root	Suffix
	non-constructed medical term	

Clinical Pearls:

- Benign tumors are non-cancerous growths, commonly caused by environmental factors, genes, inflammation, or stress. They typically serve no purpose and do not require treatment.
- Examples of benign tumors include adenomas, moles, and neoplasms.
- Benign prostatic hyperplasia is an enlargement of the prostate gland which can cause urinary symptoms including frequent urination, weak urinary stream, and incomplete emptying of the bladder. Treatments include doxazosin, tamsulosin, terazosin, dutasteride, and finasteride. Benign prostatic hyperplasia can be an adverse effect of testosterone.

BLEPHARITIS

Tags: Ocular

Definition: Inflammation of the eyelid

Pronunciation: bleh-fuh-RY-tis

Prefix	Root	Suffix
	blepharo: eyelid	-itis: inflammation

Clinical Pearls:

- Blepharitis is a common condition involving inflammation of the eyelid. Patients may present with itchiness, crusting of the eyelid, blurred vision, and redness or swelling of the eyelid.
- Causes include allergies, clogged oil glands, skin conditions, dandruff, dry eyes, or adverse effects of medications, such as travaprost.
- Blepharitis is a chronic condition, and while not contagious, failure to treat can result in complications including pink eye, sty, or a chalazion.
- Treatment includes use of warm compresses, eyelid cleansing, artificial tears, and topical formulations that fight infection and treat inflammation.

BRADYARRHYTHMIA

Tags: Cardiology

Definition: A disturbance in normal heart rhythm resulting in a slow heart rate, or bradycardia

Pronunciation: bray-dee-uh-rith-MEE-uh

Prefix	Root	Suffix
brady: slow	rhythm/o: regular repeated pattern	-ia: condition

Clinical Pearls:

- Bradyarrhythmia describes a disturbance in normal heart rhythm which results in bradycardia, or a slow heart rate of less than 60 beats per minute. Bradyarrhythmias are largely due to a decline in cardiac output, resulting in symptoms such as hypotension, dizziness, fatigue, syncope, and confusion.
- This may be an adverse effect of certain medications including amiodarone, verapamil, and beta blockers such as metoprolol.
- Treatment may include use of a pacemaker and medication management to control heart rhythm.

BRADYCARDIA

Tags: Cardiology

Definition: An abnormally slow heart rate of less than 60 beats per minute

Pronunciation: bray-dee-CAR-dee-uh

Prefix	Root	Suffix
brady: slow	cardi/o: heart	-ia: condition

Clinical Pearls:

- Bradycardia may be caused by ischemia due to heart attack or heart failure, as a complication of surgery or underlying disease, by electrolyte imbalances, or as a side effect of medications.
- Patients are at greater risk for bradycardia with increasing age, hypertension, smoking, drugs, and stress. Controlling risk factors and maintaining a healthy lifestyle is important in reducing risk.
- Bradycardia may be an adverse effect of certain medications including amiodarone, beta blockers, and calcium channel blockers. The risk of bradycardia increases when these medications are used together.
- Bradycardia can affect blood flow to organs, and result in symptoms such as dizziness, lightheadedness, shortness of breath, chest pain, and confusion.
- Management may involve addressing the underlying cause, adjusting or removing medications which impact heart rate, and using a pacemaker.

BRADYKINESIA

Tags: Neurology, Musculoskeletal

Definition: Abnormally slow movement

Pronunciation: bray-dee-kuh-NEE-zhuh

Prefix	Root	Suffix
brady: slow	kinesis: movement	-ia: condition

Clinical Pearls:

- Bradykinesia is a hallmark symptom of Parkinson's disease, as patients must have bradykinesia and at least one other symptom (tremor, rigidity, or postural instability) for diagnosis. Patients with bradykinesia will have slowness of movement, difficulty initiating movement, and a decrease in facial expressions.
- Bradykinesia may also be an adverse effect of medications which decrease dopamine, mimicking the pathophysiology of Parkinson's disease. This can occur in patients with schizophrenia on antipsychotics, and may require dosage adjustment or switching agents.
- Medications which increase dopamine levels, such as pramipexole and ropinirole, can be used for management of Parkinson's symptoms, such as bradykinesia.

BRONCHITIS

Tags: Pulmonology

Definition:	Inflammation of the bronchial tubes
Pronunciation:	bron-KAI-tis

Prefix	Root	Suffix
	bronch/o: bronchial tube	-itis: inflammation

Clinical Pearls:

- Acute bronchitis is caused by respiratory viruses and does not require treatment with antibiotics. Symptoms include cough, sore throat, fatigue, and lethargy. Symptoms will typically resolve on their own within about 3 weeks.
- Cough suppressants are not recommended for a productive cough, or one that is producing mucous. Chronic bronchitis may be caused by smoking, genetic factors, or long-term exposure to chemical irritants, pollutants, or dust. Symptoms include chronic cough, excessive mucous production, and presence of microorganisms in the sputum. Chronic bronchitis lasts for more than three consecutive months in a year, for two consecutive years.
- Treatment of chronic bronchitis requires avoiding exposure to the irritant, and acute exacerbations may require oxygen, bronchodilators (such as albuterol) and antibiotics.
- Patients should receive appropriate vaccinations, which may include vaccinations for influenza and pneumococcal disease.

BRONCHODILATOR

Tags: Pulmonology

Definition: A class of medications commonly used to expand or widen the bronchial tubes to open airways

Pronunciation: bron-koh-DYE-lay-ter

Prefix	Root	Suffix
	bronch/o: bronchial tube	dilator: widen, expand

Clinical Pearls:

- Bronchodilators can be used to relieve symptoms in airway diseases, such as asthma, bronchitis, and chronic obstructive pulmonary disease.
- Short-acting beta$_2$-agonists, such as albuterol and levalbuterol, can be administered via inhaler or nebulizer to rapidly open up the airways before exercise or when patients have sudden shortness of breath. For this reason, they are known as "rescue inhalers."
- Adverse effects of short-acting beta$_2$-agonists include tachycardia and bronchospasm. Overuse can lead to tachyphylaxis, or a diminished response.
- Other types of bronchodilators include long-acting beta$_2$-agonists, such as salmeterol and formoterol, and anticholinergic inhalers such as ipratropium and tiotropium.
- When treating airway disease, the underlying pathophysiology must be addressed. Therefore, bronchodilators alone may not be appropriate depending on disease and severity.

BRONCHOSPASM

Tags: Pulmonology

Definition: A contraction of the bronchial tubes, resulting in a narrowed airway and difficulty breathing

Pronunciation: braan-koh-SPAH-zm

Prefix	Root	Suffix
	bronch/o: bronchial tube	spasm: involuntary muscle contraction

Clinical Pearls:

- Bronchospasm can be caused by medications, exercise, cold weather, infection, or the presence of irritants and allergens, such as dust, pet dander, pollutants, or cigarette smoke.
- Medications which induce bronchospasm include aspirin, beta blockers like carvedilol and metoprolol, and NSAIDs like celecoxib, ibuprofen, and naproxen. Bronchodilators can also cause paradoxical bronchospasm.
- Symptoms of bronchospasm include difficulty breathing, chest tightness, shortness of breath, and wheezing.
- Treatment includes short- and long-acting bronchodilators and inhaled or oral steroids. Patients should also be counseled to manage precipitating factors, such as avoiding allergens, quitting smoking, and using caution when exercising in cold weather.

BULIMIA

Tags: Metabolic

Definition: An eating disorder characterized by distorted body image, and a cycle of overeating followed by purging

Pronunciation: buh-LEE-mee-uh

Prefix	Root	Suffix
	non-constructed medical term	

Clinical Pearls:

- Bulimia is most common in young women, presenting in adolescents and young adults.
- Patients may alternate between dieting and consuming large amounts of food. They may use purging to control weight, and this involves vomiting or the use of laxatives and diuretics.
- As patients may fluctuate between high and low body weights, they may experience a distorted body image, guilt, and depression associated with their condition.
- Patients may require treatment for electrolyte abnormalities, such as hypokalemia, esophagitis, and tooth decay. Antidepressants including selective serotonin reuptake inhibitors (SSRI) medications, like fluoxetine, can be used for treatment.
- Bupropion is contraindicated in patients with a history of anorexia or bulimia due to an increased risk of seizures.

CANDIDEMIA

Tags: Infectious Disease

Definition: An infection defined by the presence of Candida in the bloodstream

Pronunciation: can-dih-DEE-mee-uh

Prefix	Root	Suffix
	Candida: a species of fungus	-emia: blood, condition of blood

Clinical Pearls:

- Candidemia is a type of invasive candidiasis, associated with prolonged hospital stays, increased mortality, and economic burden.
- Candidemia typically occurs in patients with weakened immune systems, including patients receiving immune suppressing therapy, such as steroids or chemotherapy, patients on broad spectrum antibiotics, those with prolonged hospital or ICU stays, and patients with diabetes.
- Treatment involves identifying and removing the source of infection and treating with antifungal agents including amphotericin, caspofungin, or fluconazole.
- In some cases, patients with weakened immune systems or those on immune suppressing medications, such as transplant patients, may require prophylactic treatment with antifungal medication.

CANDIDIASIS

Tags: Infectious Disease

Definition: A fungal infection caused by Candida

Pronunciation: can-dih-DIE-uh-sis

Prefix	Root	Suffix
	Candida: a species of fungus	iasis: abnormal condition

Clinical Pearls:

- Candida normally lives on the body without issue, but candidiasis or candidemia may present in patients with weakened immune systems. This includes patients receiving immune suppressing therapy such as steroids or chemotherapy, patients on broad spectrum antibiotics, those with prolonged hospital or ICU stays, and patients with diabetes.
- Types of candidiasis include vaginal candidiasis, invasive candidiasis like candidemia, and infections of the skin, mouth, throat, and esophagus.
- Oral candidiasis, also known as thrush, is a common side effect of inhaled steroids. Patients on inhaled steroids should be counseled to rinse their mouth out with water after each dose to decrease the risk of oral candidiasis.
- Selection of medication and duration of treatment will vary depending on the site and severity of infection but may include antifungal agents like amphotericin, caspofungin, or fluconazole.
- In some cases, patients with weakened immune systems or those on immune suppressing medications may require prophylactic treatment with antifungal medication.

CARCINOGENIC

Tags: Oncology

Definition: Potential to cause cancer

Pronunciation: kar-sin-uh-JEN-ik

Prefix	Root	Suffix
	carcin/o: cancerous, cancer	-genic: produced by or in

Clinical Pearls:

- A carcinogen refers to substances, foods, and environmental factors which can cause cancer.
- Common carcinogens include pollution, alcohol, tobacco, radiation, and exposure to certain chemicals and hazardous substances.
- Medications which are carcinogenic include chemotherapy and medications which suppress the immune system, such as cyclosporine or tacrolimus.

CARCINOMA

Tags: Oncology

Definition: A cancerous mass or tumor

Pronunciation: kar-suh-NOH-ma

Prefix	Root	Suffix
	carcin/o: cancerous, cancer	-oma: mass, tumor, fluid collection

Clinical Pearls:

- A carcinoma is a type of cancer that starts in the skin or the tissue linings of the organs. They are able to spread to other parts of the body.
- This is a common type of cancer that is classified based on the type of cell from which it originates.
- Locations of carcinomas include the skin, head, neck, liver, kidney, breast, prostate, and pancreas.
- Treatment will depend on the type of carcinoma, as well as location and staging of the cancer.

CARDIOGENIC

Tags: Cardiology

Definition: Originating in the heart

Pronunciation: car-dee-oh-JEH-nik

Prefix	Root	Suffix
	cardi/o: heart	-genic: produced by or in

Clinical Pearls:

- Cardiogenic refers to conditions originating in the heart.
- Cardiogenic shock refers to a sudden decrease in blood flow to the body caused by the heart's inability to pump blood. This may be due to a heart attack and results in symptoms of hypotension, tachycardia, shortness of breath, weak pulse, cold extremities, and loss of consciousness.
- Cardiogenic shock is a contraindication to medications which decrease heart rate, such as beta blockers and calcium channel blockers.
- Cardiogenic pulmonary edema refers to excess fluid in the lungs that results from heart failure.

CARDIOMEGALY

Tags: Cardiology

Definition: An abnormal enlargement of the heart

Pronunciation: car-dee-oh-MEH-guh-lee

Prefix	Root	Suffix
	cardi/o: heart	megaly: enlargement

Clinical Pearls:

- An enlarged heart is a symptom of underlying disease caused by conditions that make the heart pump harder, such as hypertension, blocked arteries, or damaged valves. It may also be a result of a congenital condition.
- Patients may be asymptomatic, but should seek treatment if they are experiencing shortness of breath, chest pain or discomfort, or edema.
- Complications include heart failure, blood clots, and risk of heart attack.
- Treatment involves addressing the underlying cause and may require surgical procedures or medications to treat symptoms.

CARDIOTOXICITY

Tags: Cardiology

Definition: Damage to the heart

Pronunciation: car-dee-oh-TOK-sis-suh-tee

Prefix	Root	Suffix
	cardi/o: heart	toxic/o: poison,
		-ity: state of

Clinical Pearls:

- Cardiotoxicity refers to processes, disease states, or medications which cause damage to the heart.
- Medications, such as NSAIDs and some chemotherapy agents, may cause cardiovascular damage and should be used with caution in patients with underlying cardiac disease.
- NSAIDs, like celecoxib, ibuprofen, and naproxen, have a black boxed warning for cardiotoxicity.
- Doxorubicin, a chemotherapy agent in the anthracycline class, has a maximum lifetime cumulative dose due to its high risk of cardiotoxicity.
- Taking multiple medications which cause QTc prolongation together, such as amiodarone, amitriptyline, azithromycin, lithium, and venlafaxine, can result in an increased risk of cardiotoxicity.

CHOLELITHIASIS

Tags: Gastrointestinal

Definition:	Presence of gallstones in the biliary tract
Pronunciation:	koh-leh-li-THI-uh-sis

Prefix	Root	Suffix
chol/e: bill, gall	lith/o: stone, calculus	-iasis: abnormal condition

Clinical Pearls:

- Gallstones form when the body produces too much cholesterol, too much bilirubin, or when the gallbladder does not empty properly.
- The risk is higher in females, and other risk factors include diabetes, age (over 40 years), sedentary lifestyle, obesity, family history of gallstones, estrogen therapy, and a diet high in fat and cholesterol and low in fiber.
- Preventative measures include maintaining a healthy weight and incorporating a healthy diet that is high in fiber.
- Gallstones are an adverse effect of medications like atazanavir, ezetimibe, fenofibrate, and gemfibrozil. Concurrent use of these medications should be avoided due to an increased risk of gallstones. If used together, patients should be closely monitored.
- Gallstones may not require treatment in the absence of symptoms. Patients experiencing intense pain, nausea and vomiting, fever and chills, or yellowing of the skin and whites of the eyes suggestive of jaundice may require surgery to remove gallstones.

CHOLESTASIS

Tags: Gastrointestinal

Definition: A decrease or stoppage in bile flow

Pronunciation: koh-luh-STAY-sis

Prefix	Root	Suffix
	chol/e: bill, gall	-stasis: slowing or stopping

Clinical Pearls:

- Cholestasis is a type of liver disease in which bile flow is obstructed and leads to an increase in bilirubin. Symptoms can include jaundice, dark urine, light-colored stool, itchiness, nausea, and abdominal pain.
- The obstruction can be caused by disease, infection, genetics, hormone effects, pregnancy, or a physical barrier such as a tumor, cyst, or cholelithiasis.
- Cholestasis can be an adverse effect of medications, including amoxicillin, ibuprofen, erythromycin, estrogens, and tricyclic antidepressants such as amitriptyline.
- Treatment addresses the underlying condition and may require surgery.

CHOLINERGIC

Tags: Neurology

Definition: Pertaining to cells in which acetylcholine is released or produced

Pronunciation: koh-luh-NUR-jik

Prefix	Root	Suffix
	acetylcholine: neurotransmitter in the brain	-ic: pertaining to

Clinical Pearls:

- Cholinergic medications act upon acetylcholine receptors in the parasympathetic nervous system, which is the branch of the autonomic nervous system which slows heart rate, causes smooth muscle contraction, dilates blood vessels, and increases bodily secretions.
- Cholinergic medications can be used for management of multiple disease states, including myasthenia gravis, dementia and Alzheimer's disease, urinary retention, and open-angle glaucoma.
- Adverse effects associated with this class of medications include diarrhea, vomiting, urinary incontinence, increased sweating, and increased saliva production.

COLITIS

Tags: Gastrointestinal

Definition:	Inflammation of the colon
Pronunciation:	koh-LIE-tuhs

Prefix	Root	Suffix
	col/o: colon	-itis: inflammation

Clinical Pearls:

- Colitis is an inflammation of the inner lining of the colon, which can be caused by infection, medications, ischemia, or inflammatory bowel disease.
- Symptoms include diarrhea, abdominal pain, cramping, bleeding, fatigue, and weight loss.
- Treatment will depend on the underlying cause and includes supportive care, such as managing pain and maintaining hydration.
- Ulcerative colitis is a type of inflammatory bowel disease, which can cause inflammation and ulcers in the digestive tract. Treatments include steroids and immunosuppressing agents, such as azathioprine, budesonide, dexamethasone, and prednisone.
- *C. Difficile* colitis can be an adverse effect of antibiotics, like clindamycin, doxycycline, levofloxacin, and minocycline. Antibiotics can wipe out healthy gut flora in the gastrointestinal tract, leading to an increased risk of a *C. Difficile* infection and colitis.
- Patients with *C. Difficile* colitis may require treatment with antibiotics and a probiotic to replenish healthy gut bacteria. A probiotic may be given with certain antibiotics to prevent the risk of a *C. Difficile* infection.

COLONOSCOPY

Tags: Gastrointestinal

Definition: A procedure which examines the colon

Pronunciation: koh-luh-NAAS-koh-pee

Prefix	Root	Suffix
	colon/o: colon	-scopy: study or examination

Clinical Pearls:

- A colonoscopy is used to screen for colorectal cancer and is recommended for most patients starting at 50 years of age. A colonoscopy can also be used to assess intestinal symptoms such as bleeding, chronic constipation or diarrhea, and other intestinal problems.
- A long flexible tube with a camera is inserted through the rectum and examines the colon for polyps and premalignant lesions. If necessary, polyps and tissue can be removed, and a biopsy can be taken.
- Patients require sedation and bowel preparation for the procedure. Patients will be limited to only clear liquids prior to the procedure and are instructed to drink a hyperosmotic laxative, like polyethylene glycol, to empty the colon.

CONJUNCTIVITIS

Tags: Ocular

Definition: Inflammation of the conjunctiva, the lining of the eye and eyelids

Pronunciation: kuhn-junk-tuh-VAI-tis

Prefix	Root	Suffix
	conjunctiv/o: conjunctiva	-itis: inflammation

Clinical Pearls:

- Conjunctivitis can be caused by bacterial or viral infection, exposure to allergens, contact with an irritant, or medications like brimonidine, cyclosporine, gatifloxacin, methocarbamol, and moxifloxacin as an adverse effect.
- Symptoms of conjunctivitis, or “pink eye,” include a pink color in the whites of the eye, tearing, blurry vision, itching, irritation, and crusting of the eyelid.
- Viral conjunctivitis is common in adults and will often resolve within a few weeks.
- Treatment options depend on symptoms and may include artificial tears, topical antihistamines and decongestants, a cold compress, and counseling on hygiene as viral conjunctivitis can be highly contagious.
- Patients with discharge, changes to vision, or severe headache should be referred to their healthcare provider for further evaluation.

CYANOSIS

Tags: Respiratory

Definition: A bluish discoloration of the skin due to poor circulation

Pronunciation: sigh-uh-NOH-sis

Prefix	Root	Suffix
	cyano/o: blue	-osis: condition, abnormal state

Clinical Pearls:

- Cyanosis is a symptom of an underlying disease and indicates adequate oxygen is not being delivered to body tissues.
- Bluish discoloration may present in the hands and feet, mouth, lips or tongue.
- Causes can include heart failure, blood clots, hypotension, hypovolemia, pneumonia, and hypothermia.
- Treatment involves identification and management of the underlying disease.

CYSTITIS

Tags: Genitourinary

Definition:	inflammation of the bladder
Pronunciation:	si-STY-tis

Prefix	Root	Suffix
	cyst/o: urinary bladder, sac, cyst	-itis: inflammation

Clinical Pearls:

- Cystitis is a common form of inflammation and while it can be caused by other factors, is often referred to as a urinary tract infection (UTI). Acute uncomplicated cystitis is the most common form of UTI, and symptoms include increased frequency and urgency of urinations as well dysuria.
- Common medications used to treat cystitis include antibiotic therapy such as trimethoprim/sulfamethoxazole, fosfomycin, or nitrofurantoin because of their efficacy against *Escherichia coli*, the most common causative organism for UTI.
- Patients should be counseled to complete the entire course of antibiotic therapy to prevent progression to pyelonephritis.

DERMATITIS

Tags: Dermatology

Definition:	Inflammation of the skin
Pronunciation:	duhr-muh-TIE-tis

Prefix	Root	Suffix
	dermat: skin	-itis: inflammation

Clinical Pearls:

- Dermatitis is an inflammatory condition of the skin with symptoms of rash or redness, dryness, itchiness, or irritated skin.
- Atopic dermatitis, also known as eczema, is an inflammatory condition characterized by intense pruritis. Management includes non-pharmacologic interventions to control triggers, such as allergens, certain foods and fabrics, harsh chemicals, and heat and humidity.
- Treatment must address both the inflammation and pruritis. Treatment options include topical corticosteroids, topical calcineurin inhibitors (such as tacrolimus), and biologic agents like dupilumab.
- Contact dermatitis refers to inflammation of the skin due to contact with an irritant, like poison ivy or allergens. Severity and duration of symptoms can vary, and the reaction can be localized to the point of contact with the irritant or widespread if in response to an allergen.
- Treatment requires identifying and removing the trigger and managing symptoms with topical corticosteroids, oatmeal baths, and hydration of the skin. Patients should be counseled on preventative measures to avoid triggers.

DIALYSIS

Tags: Genitourinary

Definition: A treatment to filter blood of fluids and toxic waste products, often as a result of kidney failure

Pronunciation: DYE-al-uh-sis

Prefix	Root	Suffix
dia: complete, through		-lysis: breakdown, separate, destruction

Clinical Pearls:

- Dialysis is the clearance of blood and fluid via a dialyzer when the kidney is no longer capable of adequate filtration.
- Dialysis is a treatment option for patients with end-stage renal disease (ESRD). While many of the patients may benefit from transplantation, patients may undergo hemodialysis (HD) or peritoneal dialysis (PD). HD is more commonly used, but typically requires multiple weekly treatments at a dialysis center.
- Patients are eligible for dialysis at chronic kidney disease (CKD) stage 4 (which means the patient has an eGFR below 30 mL/min/1.73 m^2.

DIAPHORESIS

Tags: Dermatology, Endocrinology

Definition:	Condition of abnormal, excessive sweating
Pronunciation:	die-uh-fr-EE-sus

Prefix	Root	Suffix
	diaphar/o: sweat	esis: state of, condition

Clinical Pearls:

- Diaphoresis can be caused by a broad range of underlying conditions, including heart attack, diabetes and hypoglycemia, pregnancy, menopause, pain and withdrawal, and hyperthyroidism.
- It may also be an adverse effect of medications including hormone therapy, antidepressants such as citalopram, fluoxetine, paroxetine, sertraline and venlafaxine, or pain medications like methadone or morphine.
- Treatment will depend on identifying and managing the underlying condition.

DIARRHEA

Tags: Gastrointestinal

Definition:	Frequent passage of watery stools
Pronunciation:	die-uh-REE-uh

Prefix	Root	Suffix
dia: through		-rrhea: flow, discharge

Clinical Pearls:

- Diarrhea involves increased frequency of watery stools, which can be acute or chronic. Diarrhea may be caused by acute or chronic disease, bacterial or viral infections, and/or medications.
- Diarrhea is typically self-limiting and resolves within a few days. It is important to maintain fluid and electrolyte balance, and eliminate any food or medications which may be contributing to symptoms.
- Medications which can cause diarrhea include antibiotics, laxatives, cholinergic medications, and magnesium supplements.
- Patients may also have diarrhea as a result of *C. Difficile* colitis, which occurs when antibiotics wipe out healthy gut flora, and requires treatment with vancomycin, metronidazole, or fidaxomicin.
- Treatment includes antibiotics for travelers' diarrhea, anti-motility agents such as diphenoxylate and loperamide, and anti-diarrhea agents like bismuth subsalicylate.

DIPLOPIA

Tags: Ocular

Definition: Double vision

Pronunciation: dih-PLOH-pee-uh

Prefix	Root	Suffix
dipl/o: double	opia: vision	

Clinical Pearls:

- Diplopia can be caused by underlying disease, injury to the eye or brain, infection or medications.
- New onset diplopia should be evaluated by a medical professional to determine cause and whether there is urgency.
- In addition to double vision, patients may experience headache, nausea, pain, droopy eyelids, or weakness of the eyes.
- Medications which can cause diplopia include anticonvulsants like divalproex, lacosamide, lamotrigine, pregabalin, and topiramate.
- Treatment will depend on the underlying condition.

DYSCRASIA

Tags: Hematology

Definition: A disease or disorder, often referring to the blood

Pronunciation: diss-KRAY-zhee-uh

Prefix	Root	Suffix
dys-: bad, abnormal	cras/o: mixture	-ia: condition

Clinical Pearls:

- Dyscrasia disease or disorder of the body, commonly referring to blood dyscrasias. Blood dyscrasias refer to any hematologic disorders which affect the blood, blood vessels, lymph nodes, or bone marrow.
- Examples of common blood dyscrasias include anemia, leukemia, lymphoma, and blood clotting or bleeding disorders.
- Symptoms and treatment will depend on the type of blood dyscrasia.

DYSKINESIA

Tags: Neurology

Definition: Abnormal or involuntary movement

Pronunciation: diss-kuh-NEE-zuh

Prefix	Root	Suffix
dys-: painful, abnormal, difficult	kinesis: movement	-ia: condition

Clinical Pearls:

- Dyskinesias describe abnormal, impaired, and involuntary movements which can be caused by brain injury or with the use of certain medications like metmoclopramide. These movements can affect all or part of the body.
- Dyskinesias are commonly seen in Parkinson's disease patients, secondary to long term use of levodopa. Management may involve decreasing the dose of levodopa, or adding other medications but this must be balanced against controlling symptoms of the disease.
- Tardive dyskinesias are a side effect of antipsychotic medications, due to excess dopamine blockade, common in patients with schizophrenia.
- Symptoms of tardive dyskinesias include involuntary movements such as lip smacking, tongue thrusting, frequent blinking, and jerking or spasms of the extremities.
- Prevention of tardive dyskinesias is important as they can be permanent, even with discontinuation of the causing agent. The medication should be changed, or decreased in dosage at the first sign of tardive dyskinesia.
- Second generation antipsychotics such as aripiprazole are recommended over first-generation antipsychotics such as haloperidol due to lower risk of tardive dyskinesias.

DYSMENORRHEA

Tags: Women's Health

Definition: Painful menstruation

Pronunciation: diss-men-OH-ree-uh

Prefix	Root	Suffix
dys-: painful, abnormal, difficult	men/o: menstruation	-rrhea: flow, discharge

Clinical Pearls:

- Dysmenorrhea is a common gynecologic condition which describes painful menstruation immediately prior to, or during, menstruation. Symptoms include mild to severe cramping, pain in the stomach, hips, and thighs, vomiting and loose stools, and upset stomach.
- Non-pharmacologic treatments include application of topical heat on the abdomen, exercise, and a diet high in fruits and vegetables and low in fat and salt.
- NSAIDs (such as ibuprofen and naproxen) are effective pharmacologic treatments in managing pain and cramping. A common side effect is gastrointestinal distress, although taking with food can help.
- Women who desire contraception can be prescribed oral or injectable hormone therapy to reduce symptoms of dysmenorrhea. Selection of contraceptive agent will depend on cost, adherence, frequency of administration, and adverse effects.

DYSPEPSIA

Tags: Gastrointestinal

Definition: Indigestion

Pronunciation: diss-PEP-see-uh

Prefix	Root	Suffix
dys-: painful, abnormal, difficult	pepsia: digestion	

Clinical Pearls:

- Dyspepsia describes discomfort in the upper abdomen, or an "upset stomach." Symptoms include abdominal pain, a feeling of fullness, heartburn, bloating and gas, and nausea.
- Dyspepsia can be caused by underlying conditions like GERD, stomach ulcers, gastroparesis, or pregnancy.
- Dyspepsia can also be caused by stress, alcohol, caffeine consumption, smoking, eating too much/too fast, or eating heavy, greasy, or spicy foods.
- Medications that can cause dyspepsia include aspirin, NSAIDs, dabigatran, steroids and hormonal therapies.

DYSPHAGIA

Tags: Gastrointestinal

Definition:	Difficulty swallowing
Pronunciation:	diss-FAY-juh

Prefix	Root	Suffix
dys-: painful, abnormal, difficult	phag/o: eat, swallow	-ia: condition

Clinical Pearls:

- Dysphagia can be caused by many different underlying conditions, and management will depend on severity of symptoms.
- Symptoms can include pain when swallowing, a sensation of food being stuck in the throat, heart burn and regurgitation, an inability to swallow food and medications, and choking.
- Patients who have difficulty swallowing oral medications may require administration via an alternative route, such as topical, injectable, or through a nasogastric tube. Pharmacists should ensure appropriate dosing and administration, and counsel patients and caregivers on avoiding route specific drug and food interactions.
- Patients who are unable to swallow food and liquids for a prolonged period of time may require parenteral nutrition.

DYSPHONIA

Tags: Respiratory

Definition: Difficulty speaking

Pronunciation: diss-FOH-nee-uh

Prefix	Root	Suffix
dys-: painful, abnormal, difficult	phon/o: voice, sound	-ia: condition

Clinical Pearls:

- Dysphonia describes difficulty speaking, which can be due to damage to the vocal cord, neurologic disease, cancer, or as an adverse effect of medications like inhaled corticosteroids.
- Symptoms include hoarseness, a weak or strained voice, or a wavering voice and can be intermittent or persistent.
- Treatment will vary depending on the cause but may include speech therapy and injecting botulinum toxin into the vocal cords.

DYSPNEA

Tags: Respiratory

Definition: Difficulty breathing

Pronunciation: disp-NEE-uh

Prefix	Root	Suffix
dys-: painful, abnormal, difficult	pnea: breathing	

Clinical Pearls:

- Dyspnea can occur at rest or with exertion and can be acute or chronic.
- It is a symptom of numerous disease states, including anaphylaxis, anxiety, heart failure, heart attack, pneumonia, respiratory infections, blood clots, asthma, COPD, or pregnancy.
- Dyspnea can present as chest tightness, shortness of breath, shallow breathing, or difficulty taking deep breaths.
- Dyspnea treatment will depend on the underlying cause. A patient with dyspnea secondary to asthma or chronic obstructive pulmonary disease (COPD), may require bronchodilator treatment whereas a patient with dyspnea for heart failure with edema might require diuretic therapy to remove excess fluid.
- New onset dyspnea should be evaluated for underlying cause and urgency as this may be an indicator of heart attack or blood clots in the lungs.

DYSRHYTHMIAS

Tags: Cardiology

Definition: An abnormal electrical rhythm

Pronunciation: diss-rith-MEE-uh

Prefix	Root	Suffix
dys-: painful, abnormal, difficult	rhythm/o: regular repeated pattern	-ia: condition

Clinical Pearls:

- The terms arrhythmia and dysrhythmia are often used interchangeably.
- Dysrhythmias may be caused by cardiovascular disease, ischemia, congenital defects, underlying disease states, electrolyte abnormalities, or may be an adverse effect of medications. Symptoms may include dizziness, chest pain, shortness of breath, fast or slow heart beats, and palpitations.
- Common dysrhythmias include atrial fibrillation, bradyarrhythmia's, tachyarrhythmias, ventricular and supraventricular arrhythmias.
- Electrocardiogram (ECG) results can help diagnose dysrhythmias by evaluating heart rate and rhythm.
- Abnormal levels of potassium and magnesium may precipitate or worsen dysrhythmias.
- Dysrhythmias may be an adverse effect of some medications, including bupropion, modafinil, nortriptyline, and rizatriptan.
- Treatment may include cardioversion, placement of pacemakers, or medications which control heart rate and rhythm.
- Patients with dysrhythmias may require anticoagulation to prevent risk of ischemic stroke.

DYSESTHESIA

Tags: Neurology

Definition: An abnormal or painful sensation

Pronunciation: diss -uhs-THEE-zhuh

Prefix	Root	Suffix
dys-: painful, abnormal, difficult	esthesia: sensation	

Clinical Pearls:

- Dysesthesia describes an abnormal or painful sensation, common in patients with multiple sclerosis. The pain is often described as burning, prickling, or stabbing and can affect the skin, scalp, or mouth.
- The pain is neuropathic and does not have a clear stimulus.
- Treatment can include antidepressants (amitriptyline or nortriptyline), anticonvulsants (gabapentin or pregabalin), or topical lidocaine.

DYSTONIA

Tags: Musculoskeletal

Definition: Condition of abnormal muscle tone

Pronunciation: diss-TOH-nee-uh

Prefix	Root	Suffix
dys-: painful, abnormal, difficult	tono: tone	-ia: condition

Clinical Pearls:

- Dystonia describes a condition of abnormal, painful, and prolonged muscle contraction. Dystonias can occur in schizophrenia, as an adverse effect of first-generation antipsychotic medications. They occur with onset of new medication, or upon increasing the dosage.
- Younger male patients prescribed high doses of high potency first-generation antipsychotic medications are at greater risk.
- Treatment includes administration of intramuscular or intravenous anticholinergic medications, or benzodiazepines.
- Dystonia can also occur in patients with Parkinson's disease. They commonly occur at the end of a dosing interval, and resolve upon administration of carbidopa/levodopa doses.
- Strategies to reduce dystonia in Parkinson's disease include administration of a long-acting dopamine agonist or long-acting carbidopa/levodopa at bedtime.

DYSURIA

Tags: Genitourinary

Definition: Painful urination

Pronunciation: diss-YOUR-ee-uh

Prefix	Root	Suffix
dys-: painful, abnormal, difficult	-uria: urination, condition of urine	

Clinical Pearls:

- Dysuria can be caused by urinary tract infections, vaginal or prostate infections, sexually transmitted diseases, or kidney disease.
- Urinary tract infections are caused by bacteria entering the urethra and can affect the urethra, ureters, bladder, or kidneys.
- Symptoms of dysuria include painful urination, discomfort, and a burning sensation. Healthcare providers should ask about other symptoms, such as fever, flank pain, discharge, and presence of blood or pus in the urine to determine the cause of dysuria.
- Antibiotic selection and treatment duration will depend on the suspected organism, the severity of the infection, and patient past medical history and risk factors.
- Phenazopyridine can be used to treat dysuria but does not treat underlying infection. It should not be used for more than 2 days in patients with a urinary tract infection. Patients should be counseled on the adverse effect of red or orange discoloration of bodily fluids.

ECCHYMOSIS

Tags: Hematology

Definition: Discoloration, or bruising, of the skin due to extravasation of blood

Pronunciation: ek-uh-MOH-sis

Prefix	Root	Suffix
	non-constructed medical term	

Clinical Pearls:

- Ecchymosis, or bruising of the skin, can be due to injury and is not typically associated with long-term repercussions. Patients with unexplained or extensive ecchymosis should seek medical treatment to determine the underlying cause which can include HIV, certain cancers or clotting or bleeding disorders.
- Medications which increase the risk of bleeding and can cause ecchymosis include aspirin, NSAIDs, antidepressants, anticoagulants, and supplements including fish oil, vitamin E, garlic, and ginseng.
- Patients with clotting or bleeding disorders, or those taking medications for anticoagulation, should watch for unexplained bruising, bruising which does not improve or worsens, signs and symptoms of bleeding, or bleeding which does not stop within a reasonable period of time.
- If necessary, treatment may include discontinuing medications which contribute to bruising or bleeding risk, adjusting medication doses, and monitoring for signs and symptoms of bleeding.

EDEMA

Tags: Miscellaneous

Definition: Swelling of body tissues due to excess accumulation of fluid

Pronunciation: uh-DEE-muh

Prefix	Root	Suffix
	-edema: swelling	

Clinical Pearls:

- Edema can affect tissues throughout the body, but is commonly seen in the extremities.
- It can be an adverse effect of medications as well as pregnancy, sodium disorders, blood clots or underlying disease, and organ failure including the heart, kidney, or liver.
- Symptoms include swelling or puffiness, stretched skin, and skin that retains an indentation when pressed upon. Edema can also cause shortness of breath and difficulty breathing.
- Medications which can cause edema include NSAIDs (such as celecoxib), estrogens, steroids, pioglitazone, and rosiglitazone.
- Treatment will depend on the underlying cause but may require fluid or sodium restriction, as well as removing excess fluid with a diuretic like bumetanide, furosemide, or torsemide.

EMBOLISM

Tags: Hematology

Definition:	Obstruction of an artery or blood vessel due to air, blood clot, or fatty deposits
Pronunciation:	em-buh-LIH-zum

Prefix	Root	Suffix
	embolo/o: embolus	-ism: process, condition

Clinical Pearls:

- An embolism can occur in different parts of the body. The symptoms and severity will depend on the location of the embolism. Patients with a deep vein thrombosis (DVT) or atrial fibrillation are at increased risk for embolism, and may require preventative anticoagulation to reduce the risk of embolism.
- A pulmonary embolism occurs in the lungs, and is commonly due to a deep vein thrombosis which travels from the extremities to the lungs. Symptoms can include shortness of breath and chest pain. This is a life-threatening medical emergency and requires prompt medical attention and treatment with anticoagulation.
- A stroke can be caused by an embolism in the brain. Symptoms can include sudden inability to walk, talk, or move part of the body. Emergency treatment must be sought immediately, as time will determine appropriate therapy and whether patients are eligible for tissue plasminogen activator (TPA) treatment.
- A heart attack can be due to an embolism in the heart. Symptoms can include chest pain, shortness of breath, sweating, and palpitations. This is a life-threatening medical emergency. Treatment can include surgery and medication management.
- Medications which can increase risk of embolism include darbepoetin, epoetin, estradiol, progesterone, and tamoxifen.

EMESIS

Tags: Gastrointestinal

Definition:	Vomiting
Pronunciation:	EH-muh-sus

Prefix	Root	Suffix
	emeto: vomiting	-sis: state of, condition

Clinical Pearls:

- Common causes of emesis can include headache, pregnancy, chemotherapy, and gastroenteritis.
- Treatment should include monitoring for, and managing, dehydration and electrolyte abnormalities, avoiding solid food, and rest. Antiemetic medications can be used to treat or prevent nausea and vomiting, regardless of the cause.
- Medications that can be used for treatment of nausea and vomiting include aprepitant, ondansetron, prochlorperazine, and promethazine. Patients should be counseled on proper administration based on medication route and formulation.
- Patients at high risk for nausea and vomiting, such as those receiving chemotherapy, may require prophylactic doses of antiemetic medications. Selection of antiemetic medication should consider safety, efficacy, adverse events, cost, and drug interactions.

EMETOGENIC

Tags: Gastrointestinal

Definition: Causing nausea and vomiting

Pronunciation: eh-meh-toh-JEH-nik

Prefix	Root	Suffix
	emeto: vomiting	-genic: produced by or in

Clinical Pearls:

- Chemotherapy is commonly categorized by emetogenicity, or how likely the medication is to cause emesis.
- Patients will require premedication with antiemetics depending on whether chemotherapy is classified as low, moderate, or highly emetogenic.
- Medications that can be used for treatment of chemotherapy induced nausea and vomiting include aprepitant, dexamethasone, dolasetron, granisetron, and ondansetron.

EMPYEMA

Tags: Pulmonology

Definition: A collection of pus in the pleural cavity of the lungs

Pronunciation: em-PIE-ee-muh

Prefix	Root	Suffix
	empyema (Greek origin)	-ema: condition

Clinical Pearls:

- Empyema is caused by infection, which causes a buildup of fluid and pus in the pleural cavities of the lung.
- Symptoms can include chest pain, shortness of breath, fever, chills, and cough.
- Treatment involves drainage of the pus and antibiotics to manage the infection.

ENCEPHALITIS

Tags: Neurology

Definition:	Inflammation of the brain
Pronunciation:	en-seh-fuh-LIE-tus

Prefix	Root	Suffix
	encephal/o: brain	-itis: inflammation

Clinical Pearls:

- Encephalitis is inflammation of the brain, most commonly caused by viral infection. Symptoms include headache, fever and malaise, rigidity, nausea and vomiting, and photophobia.
- Common organisms that cause encephalitis include West Nile virus, herpes simplex virus, and enteroviruses. Vaccination has reduced cases of encephalitis secondary to polio, mumps, rubella, and varicella.
- Treatment options are limited and involve support care measures, such as seizure control, prevention of embolisms, hemodynamic management, and reducing intracranial pressure.
- Antiviral medications such as acyclovir, foscarnet, and ganciclovir can be used for treatment. Delaying antiviral therapy has been linked with increased mortality so empiric therapy may be started despite pending test results.

ENCEPHALOPATHY

Tags: Neurology

Definition:	Disease affecting brain function or structure
Pronunciation:	en-seh-fuh-LAW-pah-thee

Prefix	Root	Suffix
	encephal/o: brain	-pathy: disease

Clinical Pearls:

- Encephalopathy describes damage or disease which affects the function or structure of the brain. As a result, patients can have temporary or permanent changes to their mental status including memory loss, confusion, difficulty thinking clearly, seizures, and dementia.
- Encephalopathy can be caused by infection, metabolic disturbances, hypoxia, intoxication, or disease such as diabetes, liver disease, or thyroid disease.
- Hepatic encephalopathy results from accumulation of toxins due to decreased liver function. Treatment includes lactulose and rifaximin.

ENDOCARDITIS

Tags: Cardiology, Infectious Disease

Definition: Inflammation of the heart's endocardium, the lining of the heart's chambers and valves

Pronunciation: en-doh-car-DIE-tis

Prefix	Root	Suffix
endo: in, within	cardi/o: heart	-itis: inflammation

Clinical Pearls:

- Endocarditis is inflammation of the lining of the heart chambers and valves, commonly caused by infection.
- Patients with heart failure, valvular disease, a history of IV drug use, and prosthetic heart valves are at greater risk for infection.
- Proper dental care is important as bacteria can enter the bloodstream through the gums, leading to endocarditis.
- Symptoms may include fever, shortness of breath, and presence of a heart murmur.
- Diagnosis will look for bacteria in the bloodstream (bacteremia), and growth of bacteria on the heart valves (vegetation), which can be identified with an echocardiogram.
- Treatment includes parenteral bactericidal antibiotics and may require surgery to remove infection source and repair damaged valves. Selection of empiric antibiotic therapy will depend on suspected organism, patient past medical history, and whether the patient has native or prosthetic heart valves.
- High-risk patients may require prophylactic antibiotics before procedures with risk of bacteremia, such as dental procedures.

EOSINOPHILIA

Tags: Immunology

Definition: An abnormally high level of eosinophils in the blood

Pronunciation: ee-oh-sin-oh-FILL-ee-uh

Prefix	Root	Suffix
	eosin/o: red	philia: attraction to

Clinical Pearls:

- Eosinophils are a type of white blood cells which fight infection, inflammation, and allergies.
- Eosinophilia can be an indication of parasitic or fungal infections, allergic reactions, certain types of cancers, or inflammatory and autoimmune conditions like asthma or atopic dermatitis. Patients with eosinophilia will require examination to determine the underlying condition and confirm diagnosis.

EPISTAXIS

Tags: Miscellaneous

Definition: Bleeding from the nose

Pronunciation: eh-puh-STAK-sis

Prefix	Root	Suffix
	non-constructed medical term	

Clinical Pearls:

- Common causes of epistaxis include dry air, irritation, high altitude, injury, medications, and frequent use of nasal sprays.
- Medications which can cause epistaxis include fluticasone, mometasone, and triamcinolone nasal sprays as well as blood thinning medications such as clopidogrel, prasugrel, and warfarin.
- Self-care for epistaxis can include leaning the head forward, applying a cold compress or ice to the bridge of the nose, and applying pressure by pinching both nostrils at the bottom of the nose for 5 minutes.
- Patients should notify their healthcare provider or seek medical treatment if they have a nosebleed which does not stop despite applying pressure for a period of about 15-20 minutes. Patients on anticoagulation may experience nosebleeds more commonly, and should notify their healthcare provider, especially if the nosebleed is excessive.

ERYTHEMA

Tags: Dermatology

Definition: Redness of the skin, typically caused by injury or inflammation of blood vessels

Pronunciation: er-uh-THEE-muh

Prefix	Root	Suffix
	erythr/o: red	-ema: condition

Clinical Pearls:

- Erythema can be caused by infection, inflammation, injury, or allergic reaction.
- Symptoms can range from mild to severe, and can include a rash, pruritus, painful sores, blisters, fever, and joint pain.
- Symptoms and treatment will depend on the underlying condition and may include antibiotics, steroids, and topical treatments.

ERYTHROCYTES

Tags: Hematology

Definition:	Red blood cells
Pronunciation:	uh-RIH-thro-site

Prefix	Root	Suffix
	erythr/o: red	cyte: cell

Clinical Pearls:

- Erythrocytes contain hemoglobin, which carries oxygen and carbon dioxide between the lungs and tissues.
- Normal red blood cell count is typically between about 4-6.2 × 10^6 cells per microliter.
- When your red blood cell count is too high or too low, this can indicate an underlying condition and result in complications.
- A low erythrocyte count can be caused by blood loss, anemia, certain cancers, and kidney failure. Symptoms can include fatigue, dizziness, headache, shortness of breath, increased heart rate, and bleeding.
- A high erythrocyte count can be caused by dehydration, smoking, high altitude, and medications like erythropoietin. Symptoms can include fatigue, shortness of breath, and increased risk of blood clots.

ERYTHRODERMA

Tags: Dermatology

Definition: An inflammatory condition with widespread redness of the skin

Pronunciation: uh-RIH-thro-duhr-mah

Prefix	Root	Suffix
	erythr/o: red	derma: skin

Clinical Pearls:

- Erythroderma is a generalized condition which affects more than 90% of the body's surface area and is typically caused by an underlying disease or a hypersensitivity reaction.
- Erythroderma presents with symptoms including widespread erythema, pruritis, fever, malaise, alopecia, edema, tachycardia, and heart failure.
- Treatment will depend on the underlying condition and clinical presentation, but may include topical or oral steroids like methylprednisone and prednisone, oral antihistamines for the pruritis, and immunosuppressing agents.

ESOPHAGITIS

Tags: Gastrointestinal

Definition:	Inflammation of the esophagus
Pronunciation:	uh-sof-ah-JAI-tis

Prefix	Root	Suffix
	esophag/o: esophagus	-itis: inflammation

Clinical Pearls:

- Esophagitis is inflammation of the esophagus, the tube connecting the throat to the stomach. Esophagitis is commonly caused by gastroesophageal reflux disease (GERD), a disease in which the acidic contents of the stomach reflux back into the esophagus, causing irritation and damage to the esophagus. Other causes can include infections, certain cancers, and medications such as alendronate, clindamycin, doxycycline, and potassium.
- Symptoms include painful or difficulty swallowing, heartburn and acid regurgitation, and chest pain.
- Treatment may vary based on the underlying cause but will often include proton pump inhibitors, like esomeprazole, lansoprazole, and omeprazole and histamine receptor antagonists such as famotidine.
- Non-pharmacologic management includes avoiding food and medications which worsen reflux, losing weight, quitting smoking, and not lying down immediately after taking food or medication.

EUVOLEMIC

Tags: Hematology, Metabolic

Definition: Normal blood volume

Pronunciation: you-VOH-lee-mik

Prefix	Root	Suffix
eu: normal	vol: volume	-emia: blood, condition of blood
		-ic: pertaining to

Clinical Pearls:

- Euvolemia describes a condition of normal blood volume. The fluid status of a patient is important in managing water and electrolyte balance.
- A patient with euvolemic hyponatremia will have normal or slightly decreased sodium levels and increased total body water. Euvolemic hyponatremia is most commonly caused by syndrome of inappropriate antidiuretic hormone (SIADH) secretion, in which the body retains too water due to an excess of antidiuretic hormone. Treatment includes restricting water, identifying the underlying cause, and vasopressin antagonists, such as tolvaptan.
- A patient with euvolemic hypernatremia will have normal or slightly increased sodium levels and decreased total body water. Euvolemic hypernatremia is most commonly caused by diabetes insipidus, in which the body loses too water due to a deficiency of antidiuretic hormone. Treatment includes vasopressin agonists, such as desmopressin.

EXTRAVASATION

Tags: Miscellaneous

Definition: The leakage of fluid from a blood vessel to the surrounding tissue

Pronunciation: ek-strah-VUH-say-shun

Prefix	Root	Suffix
extra: outside	vas/a: vessel	-ation: process, condition

Clinical Pearls:

- Extravasation describes the leakage of intravenous fluids or medications from the vasculature to the surrounding tissues. This can occur in peripheral or central vasculature, and may be due to poor positioning of an intravenous line, fragile blood vessels, or leakage.
- Symptoms and extent of injury will vary depending on the causative agent, but can include erythema, pain, tenderness, irritation, and tissue necrosis in more severe cases.
- Vesicants refer to medications which can cause serious harm or tissue injury when they extravasate, such as many chemotherapeutic agents.
- Management may include discontinuing the infusion, aspirating fluid or blood from the surrounding tissues, elevation of the arm, application of a warm or cold compress, and agents to minimize damage, such as hyaluronidase.

FASCIITIS

Tags: Musculoskeletal

Definition: Inflammation of the connective tissue beneath the skin

Pronunciation: fa-SHEE-ai-tis

Prefix	Root	Suffix
	fasci/o: fascia	-itis: inflammation

Clinical Pearls:

- Plantar fasciitis refers to stabbing pain in the foot which is worse when initiating walking, or standing for long periods of time. It is common in runners, patients with obesity, or those who spend long periods of time standing.
- Treatment may involve physical therapy, orthopedic shoes, NSAIDs (such as meloxicam) for pain and inflammation, steroid injections, or may require surgery.
- Necrotizing fasciitis refers to a rare but serious infection in which flesh-eating bacteria cause death of tissues in the body. Bacteria can enter the body through surgical wounds, burns, or puncture wounds. Patients with suppressed immune systems are at greater risk.
- Symptoms of necrotizing fasciitis can include pain, inflammation, fever, and redness. Treatment can involve surgical removal of dead tissue, intravenous antibiotics, limb amputation, and supportive care for hypotension and dehydration.

FEBRILE

Tags: Immunology

Definition: Pertaining to a fever

Pronunciation: FEH-bruhl

Prefix	Root	Suffix
	febr/i: fever	-ile: pertaining to

Clinical Pearls:

- A fever is defined as body temperature above the normal range of about 98-98.6°F. Fever can be secondary to numerous causes, such as infection, malignancy, or autoimmune disease.
- A febrile patient should be evaluated to determine the underlying cause and appropriate treatment for their fever, as well as manage complications such as febrile seizures.
- Antipyretic medications, which include acetaminophen, aspirin, ibuprofen, and naproxen can be given to reduce fever in adults but may or may not be appropriate depending on patient specific characteristics. Acetaminophen and ibuprofen can be given to reduce fever. When dosing these medications for a child, careful consideration should be given to the child's age and weight to determine appropriate agent and dosing.
- When recommending acetaminophen or ibuprofen, pharmacists should counsel patients on maximum daily dosage to avoid toxicity, and advise patients to watch for other medications that may have acetaminophen or ibuprofen as an active ingredient.
- Patients with febrile neutropenia, a serious complication of chemotherapy, will require antibiotic treatment and close monitoring.

FIBRINOLYSIS

Tags: Hematology

Definition: The breakdown of blood clots

Pronunciation: fye-brin-OH-lie-sis

Prefix	Root	Suffix
	fibrin/o: fibrin	lysis: breakdown

Clinical Pearls:

- Fibrinolytic therapy, such as alteplase or tenecteplase, can be given after heart attacks and strokes to breakdown blood clots.
- Patients with a heart attack can receive fibrinolysis when surgical intervention is not an option. Therapy should be given within 30 minutes of arrival to the hospital, assuming no contraindications to therapy.
- Patients with ischemic stroke can receive fibrinolytic therapy if the stroke occurred in the last 3-4.5 hours, assuming no contraindications to therapy.
- Contraindications to fibrinolytic therapy include a history of hemorrhagic stroke, previous ischemic stroke in the last 3 months, active bleed, uncontrolled hypertension, or head trauma or surgery in the last 2-3 months.

FIBROMYALGIA

Tags: Musculoskeletal

Definition: A chronic disease characterized by widespread musculoskeletal pain

Pronunciation: fie-bro-my-AL-juh

Prefix	Root	Suffix
	fibro: fibrous tissues, my/o: muscle	-algia: pain

Clinical Pearls:

- Fibromyalgia causes widespread musculoskeletal pain and stiffness, fatigue, headaches, difficulty sleeping, cognitive impairment, and depression. Diagnosis can be difficult and controversial due to an absence of objective clinical symptoms.
- Treatment should target patient symptoms, and should incorporate interventions such as exercise, good sleep hygiene, and managing comorbidities. Medications used for treatment of fibromyalgia include amitriptyline, duloxetine, and pregabalin.

FIBROSIS

Tags: Musculoskeletal

Definition: An abnormal thickening or increase in fibrous connective tissues

Pronunciation: fie-BRO-sis

Prefix	Root	Suffix
	fibr/o: fibrous tissues	-osis: condition, abnormal state

Clinical Pearls:

- Fibrosis describes the condition in which fibrous connective tissue replaces normal tissue leading to scar tissue and permanent remodeling.
- Pulmonary fibrosis is a lung disease which can be caused by exposure to environmental toxins, medications like amiodarone and chemotherapy, radiation, or certain diseases like rheumatoid arthritis or lupus.
- Patients with pulmonary fibrosis may have shortness of breath, fatigue, dry cough, and widening (clubbing) of the fingers and toes.
- Two therapies are approved for treatment of pulmonary fibrosis; nintedanib and pirfenidone; each medication works to slow the rate of fibrosis in the lungs.

GASTRITIS

Tags: Gastrointestinal

Definition:	Inflammation of the stomach
Pronunciation:	gah-STRY-tis

Prefix	Root	Suffix
	gastr/o: stomach	-itis: inflammation

Clinical Pearls:

- Gastritis can be caused by excessive drinking, medications, *H. Pylori* infection, stress, diet, or an immune mediated response. Symptoms can be acute or chronic, and include stomach pain, decreased appetite, nausea and vomiting, bloating, fatigue, and vomiting blood or blood in the stool.
- Medications which can cause gastritis include aspirin, NSAIDs, clopidogrel, and dabigatran.
- Patients with gastritis should avoid alcohol and medications which can cause or aggravate symptoms. Patients with an *H. Pylori* infection will require antibiotic therapy.
- Other medications used to treat gastritis are sucralfate and medications which reduce stomach acid, such as antacids, H2 receptor antagonists (H2RA, famotidine and ranitidine), proton pump inhibitors (PPI; omeprazole and lansoprazole).

GASTROENTERITIS

Tags: Gastrointestinal

Definition: Inflammation of the stomach and intestines

Pronunciation: gah-stroh-en-ter-AY-tis

Prefix	Root	Suffix
	gastr/o: stomach	-itis: inflammation
	enter/o: intestines	

Clinical Pearls:

- Gastroenteritis is commonly caused by a bacterial, viral, or parasitic infection transmitted by poor hygiene or contaminated food and water. Symptoms can include diarrhea, nausea and vomiting, fever, cramping, and signs of dehydration.
- Gastroenteritis is typically self-limiting, resolving within a few days. It is important to maintain fluid and electrolyte balance. Oral rehydration solutions are recommended over sports drinks, although patients with severe dehydration may require intravenous hydration.
- Antibiotics, antiemetics, and antimotility agents are typically not recommended. Vaccines like the rotavirus vaccine can help prevent certain types of gastroenteritis in children, who are at increased risk for dehydration.

GASTROPARESIS

Tags: Gastrointestinal

Definition: Partial paralysis of the stomach

Pronunciation: gah-stroh-pah-REE-sus

Prefix	Root	Suffix
	gastr/o: stomach	paresis: partial paralysis, weakness

Clinical Pearls:

- Gastroparesis describes a condition of delayed gastric emptying.
- It is common in patients with diabetes, called diabetic gastroparesis, but can also occur as a result of surgery, infection, or medications which slow the rate of stomach emptying.
- Symptoms include a feeling of fullness, bloating, nausea and vomiting, pain and weight loss.
- Management consists of modifying diet, maintaining adequate nutrition and hydration, managing optimal blood glucose in patients with diabetes.
- Medications which increase the rate of gastric emptying, such as metoclopramide and erythromycin, as well as antiemetics, can be prescribed to manage symptoms interfering with activities of daily living.

GINGIVITIS

Tags: Miscellaneous

Definition: Inflammation of the gums

Pronunciation: jin-juh-VAI-tis

Prefix	Root	Suffix
	gingiv/o: gum	-itis: inflammation

Clinical Pearls:

- Gingivitis is inflammation of the gums, characterized by receding gums, bad breath, and redness, swelling, or bleeding when brushing or flossing teeth. If left untreated, gingivitis can progress to include the connective tissue and the bone.
- Good oral hygiene and regular dentist visits are important to prevent gingivitis. Chlorhexidine oral rinse may be prescribed as a swish and spit treatment of gingivitis.

GONORRHEA

Tags: Genitourinary, Infectious Disease

Definition: A sexually transmitted infection involving inflammatory discharge

Pronunciation: gaw-nuh-REE-uh

Prefix	Root	Suffix
	gonos: seed	-rrhea: flow, discharge

Clinical Pearls:

- Gonorrhea is a highly transmissible sexually transmitted infection, which can affect men and women. Patients may be asymptomatic, or present with symptoms such as discharge from the penis, vagina, or rectum, bleeding, dysuria, and pain.
- Antibiotics use to treat gonorrhea include azithromycin, cefuroxime, ceftriaxone, and doxycycline. High rates of resistance to oral treatment options complicate treatment.
- Patients should be counseled on safe sex practices to reduce the risk of transmission. All patients diagnosed with gonorrhea should notify their partners, who will require evaluation and treatment.

GRANULOCYTOPENIA

Tags: Immunology

Definition: A decrease in the number of granulocytes

Pronunciation: gran-yoo-loh-sigh-toh-PEE-nee-uh

Prefix	Root	Suffix
granulo: granule	cyto: cell	penia: deficiency

Clinical Pearls:

- Granulocytes are a type of white blood cell which help fight infection. These include neutrophils, eosinophils, and basophils. Granulocytopenia is a rare but serious condition in which the body does not make enough white blood cells.
- The terms agranulocytosis, granulocytopenia, and neutropenia are often used interchangeably. It can be caused by autoimmune disorders, infection, chemotherapy, or medications with examples including colchicine, ezetimibe, and hydralazine.
- Clinical presentation includes fever, increased risk of infection, sore throat, fever, malaise, chills, and a neutrophil count < 500 cells/μL.
- When caused by medications, onset is typically delayed with symptoms occurring about a month after drug initiation.
- Treatment can include antibiotics if infection is present, management of autoimmune disorders, and medications to stimulate production of white blood cells such as filgrastim or pegfilgrastim.

GYNECOMASTIA

Tags: Endocrinology

Definition: Breast enlargement in men due to a non-cancerous growth in breast tissue

Pronunciation: guy-nuh-koh-MAS-tee-uh

Prefix	Root	Suffix
	gynec/o: woman	-ia: condition
	mast/o: breast	

Clinical Pearls:

- Gynecomastia is a condition in which males have benign enlargement of one or both breasts, due to an imbalance in testosterone and estrogen. Gynecomastia can be caused by obesity, disease, or medications.
- Medications which can cause gynecomastia include estrogen, dutasteride, finasteride, and spironolactone.
- Treatment is not usually required as gynecomastia can resolve on its own but management may include treating the underlying condition, surgery, or medications which reduce estrogen in the body, such as tamoxifen.

HEMATOMA

Tags: Hematology

Definition: A collection of blood, usually due to trauma or injury

Pronunciation: hee-muh-TOH-muh

Prefix	Root	Suffix
	hemat/o: blood	-oma: mass, tumor, fluid collection

Clinical Pearls:

- Hematomas can occur anywhere in the body, and are commonly due to trauma, injury, or blood thinning medications and symptoms will vary depending on size and location.
- Subcutaneous hematoma symptoms can include erythema, swelling, tenderness, or pain.
- Subdural hematoma symptoms can include headache, seizure, poor coordination, or problems with speech and balance.
- Spinal hematoma can cause numbness, weakness, difficulty walking, or paralysis.
- Blood thinning medications, such as apixaban, dabigatran, edoxaban, enoxaparin, and rivaroxaban, have a black box warning for risk of hematoma with spinal or epidural puncture. Management will commonly require surgical intervention, as well as holding any medications which can cause or increase risk of bleed.

HEMATURIA

Tags: Genitourinary

Definition:	Blood in the urine
Pronunciation:	hee-muh-TUR-ee-uh

Prefix	Root	Suffix
	hemat/o: blood	-uria: urination, condition of urine

Clinical Pearls:

- Hematuria can be caused by urinary tract infection, cystitis, pyelonephritis, kidney stones, kidney disease, or certain types of cancers. Symptoms of hematuria are pink or red urine due to the presence of blood.
- Medications which can cause hematuria include anticoagulants, cyclophosphamide, entecavir, and emtricitabine. A urinalysis can detect blood in the urine, as well as determine whether there is underlying infection.
- Treatment may include antibiotics to treat infection, shock wave therapy to break up kidney stones, or holding medications which cause bleeding.

HEMIPLEGIA

Tags: Neurology, Musculoskeletal

Definition: Paralysis on one side the body

Pronunciation: hem-eh-PLEE-jee-uh

Prefix	Root	Suffix
hemi: half	-plegia: paralysis	

Clinical Pearls:

- Hemiplegia can be caused by brain or spinal cord injury. Symptoms can range from weakness to full paralysis on one side of the body.
- Serotonin receptor agonists used to treat migraines, such as eletriptan, rizatriptan, and sumatriptan, have a rare but serious adverse effect of hemiplegia.

HEMOLYTIC

Tags: Hematology

Definition:	Destruction of red blood cells
Pronunciation:	hee-moh-LIH-tik

Prefix	Root	Suffix
	hem/o: blood	lytic: destruction

Clinical Pearls:

- Commonly refers to hemolytic anemia, a condition of red blood cell deficiency due to premature destruction of red blood cells. Hemolytic anemia can be caused by autoimmune disease, infection, leukemia, or lymphoma. Symptoms can include tachycardia, dizziness, lightheadedness, dyspnea, fatigue, pale skin, and red or brown urine.
- Medications which can cause hemolytic anemia include diclofenac, glipizide, nitrofurantoin, penicillin, phenazopyridine, and trimethoprim/sulfamethoxazole.
- Management can include prednisone, cyclophosphamide, or rituximab to suppress the immune system, blood transfusions, and may require treating the underlying condition.
- Patients with a G6PD deficiency are at increased risk of hemolytic anemia and should be cautious taking medications with this adverse effect.

HEMOPTYSIS

Tags: Hematology

Definition:	Spiting or coughing up blood from the respiratory tract
Pronunciation:	heh-MOP-tuh-sis

Prefix	Root	Suffix
	hem/o: blood	ptysis: spitting

Clinical Pearls:

- Hemoptysis can be due to a broad range of conditions, including injury or trauma, infection, airway or pulmonary disease, or bleeding disorders. Symptom severity can vary, and patients may cough up blood or mucous streaked with blood.
- Patients should seek emergent medical care if they are coughing up large amounts of blood, have shortness of breath, or are on medications for anticoagulation.
- Treatment can include antibiotics to treat infection and cough medication to suppress coughing as well as discontinuing anticoagulation medications.

HEMORRHAGE

Tags: Hematology

Definition:	Profuse bleeding or blood loss
Pronunciation:	heh-MUR-uhj

Prefix	Root	Suffix
	hem/o: blood	rrhage: excessive flow

Clinical Pearls:

- Hemorrhage can be caused by injury or trauma, disease, bleeding disorders, or medications such as anticoagulants or NSAIDs (including ibuprofen). Signs and symptoms of hemorrhage can include hemoptysis, vomiting blood, blood in the urine or stool, epistaxis, shortness of breath, dizziness, confusion, or hypotension.
- Bleeding can be internal or external. Patients should seek emergent medical attention if bleeding is excessive, does not stop, is accompanied by shortness of breath or shock, or is caused by an injury requiring treatment.
- Treatment may include applying pressure to the wound, holding medications which cause bleeding, managing blood loss, and administering medications that promote clotting such as vitamin K.

HEPATITIS

Tags: Gastrointestinal, Infectious Disease

Definition:	Inflammation of the liver
Pronunciation:	heh-puh-TIE-tis

Prefix	Root	Suffix
	hepat/o: liver	-itis: inflammation

Clinical Pearls:

- Hepatitis describes inflammation of the liver which can be caused by viral infection, autoimmune disease, alcohol abuse, drugs, or medications. There are three main versions of viral hepatitis in the United States (A, B, and C). Symptoms of hepatitis include fatigue, abdominal pain, dark urine, light-colored stools, and jaundice.
- Medications which can cause hepatitis include allopurinol, azithromycin, carbamazepine, and divalproex.
- Hepatitis A is spread by the fecal to oral route, and is commonly transmitted by contaminated water or food. The infection is typically self-limiting for most patients. There is no treatment for hepatitis A, but there is an effective vaccine.
- Hepatitis B is spread by bloodborne or sexual transmission. There is an effective vaccine and treatment options including entecavir, lamivudine, and tenofovir.
- Hepatitis C is spread by bloodborne transmission and is the leading cause of liver cancer and transplant. Hepatitis C can be cured by treatment such as sofosbuvir and velpatasvir among others.

HEPATOMEGALY

Tags: Gastrointestinal

Definition:	Enlargement of the liver
Pronunciation:	heh-pah-toh-MEH-guh-lee

Prefix	Root	Suffix
	hepat/o: liver	megaly: enlargement

Clinical Pearls:

- Hepatomegaly can be caused by hepatitis, alcohol abuse, drug induced liver injury, liver obstruction, cholestasis, or liver congestion, such as in right-sided heart failure.
- Hepatomegaly is often asymptomatic but can include symptoms of hepatitis, such as fatigue, abdominal pain, dark urine, light-colored stools, and jaundice.
- Management will focus on controlling risk factors, such as eating a healthy diet and reducing alcohol intake.

HEPATOTOXICITY

Tags: Gastrointestinal

Definition:	Damage to the liver
Pronunciation:	heh-pah-toh-tok-SIS-ity

Prefix	Root	Suffix
	hepat/o: liver	toxic/o: poison
		-ity: state of

Clinical Pearls:

- Hepatotoxicity to processes, disease states, or medications which cause damage to the liver. It can be caused by infection, alcohol abuse, drug or toxins, and medications.
- Symptoms of hepatotoxicity can include fatigue, abdominal pain, dark urine, light-colored stools, and jaundice.
- Medications, such as fenofibrate, lacosamide, levetiracetam, lovastatin, and methotrexate, may cause hepatic damage.
- Patients with excessive alcohol use should avoid medications which increase risk of liver damage. Pharmacists can screen medication lists to identify hepatotoxic medications, as well as medications which require hepatic dose adjustment.
- Acetaminophen overdose can cause potentially fatal hepatotoxicity. Patients should avoid taking more than 4 grams per day, although some over-the-counter (OTC) labels recommend an even lower maximum threshold of 3 grams per day to reduce risk for accidental overdose. Patients should be counseled on the risks of combining acetaminophen containing products and not exceeding the maximum daily dose.

HIRSUTISM

Tags: Endocrinology

Definition:	Excessive hair growth in women in a male-like pattern
Pronunciation:	HUR-suh-tiz-um

Prefix	Root	Suffix
	hirsut/o: hairy	-ism: process, condition

Clinical Pearls:

- Describes a condition in which women have excessive growth of dark or coarse hair on their face, chest, abdomen, or back.
- Hirsutism is due to an excess of male hormones like testosterone, which can be caused by genetics, medications or diseases such as polycystic ovarian syndrome, Cushing's disease, or tumors.
- Medications which can cause hirsutism include conjugated estrogens, cyclosporine, minoxidil, and tamoxifen.
- Treatment options include oral contraceptives, spironolactone, and hair removal methods such as waxing, plucking, or laser hair removal.

HYPERAMMONEMIA

Tags: Metabolic

Definition:	Excess levels of ammonia in the blood
Pronunciation:	high-per-uh-moh-NEE-mee-uh

Prefix	Root	Suffix
hyper: excessive, above	-ammon: ammonia	-emia: blood, condition of blood

Clinical Pearls:

- A toxic accumulation of ammonia in the body commonly caused by metabolic disorders or hepatic encephalopathy. Symptoms can include changes in mental status including confusion, difficulty with memory, somnolence, and unconsciousness.
- Lactulose can be given orally or by enema to reduce ammonia levels in patients with hepatic encephalopathy. Patients may also require intermittent hemodialysis.

HYPERBILIRUBINEMIA

Tags: Gastrointestinal

Definition:	Excess levels of bilirubin in the blood
Pronunciation:	high-per-bil-ee-rue-bin-EE-mee-uh

Prefix	Root	Suffix
hyper: excessive, above	bilirubin/o: bilirubin	-emia: blood, condition of blood

Clinical Pearls:

- Bilirubin is a product of red blood cell breakdown, which is metabolized by the liver and excreted in the feces. When bilirubin levels are high, it is caused by either increased breakdown of red blood cells, such as in hemolytic anemia, or decreased function of the liver, such as in liver disease.
- Normal bilirubin levels range between 0.3 and 1.1 mg/dL.
- Babies are often born with high levels of bilirubin, leading to jaundice or yellowing of the skin and whites of the eyes.
- There are limited treatment options for high bilirubin. Management will focus on the underlying condition.

HYPERCALCEMIA

Tags: Metabolic

Definition:	Excess levels of calcium in the blood
Pronunciation:	high-per-caal-SEE-mee-uh

Prefix	Root	Suffix
hyper: excessive, above	calc/o: calcium	-emia: blood, condition of blood

Clinical Pearls:

- Hypercalcemia is a calcium level > 10.3 and is commonly caused by cancer or hyperparathyroidism. Clinical presentation can range from asymptomatic to symptoms of tiredness, confusion, depression, and constipation.
- Normal calcium levels are between 8.6 and 10.3 mg/dL. Calcium binds to albumin in the blood, so for patients with low levels of albumin, a corrected calcium may need to be calculated
  - Corrected serum calcium = serum calcium + (0.8 × [4-serum albumin])
- Maintaining calcium concentration is important for bone health, nerve conduction, muscle contraction, and coagulation.
- Treatment for hypercalcemia may involve hydration, loop diuretics like furosemide, and hemodialysis.

HYPERCALCIURIA

Tags: Metabolic, Genitourinary

Definition:	Excess levels of calcium in the urine
Pronunciation:	high-per-caal-SEE-yoo-ree-uh

Prefix	Root	Suffix
hyper: excessive, above	calci/o: calcium	-uria: urination, condition of urine

Clinical Pearls:

- Hypercalciuria can be caused by genetics, disease, or medications like loop diuretics such as furosemide.
- Hypercalciuria is a common cause of nephrolithiasis, or kidney stones. Therefore, it is important to control calcium levels and reduce urinary excretion of calcium to reduce risk of future kidney stones.
- Medications such as hydrochlorothiazide can be used to reduce urinary excretion of calcium.

HYPERCAPNIA

Tags: Respiratory

Definition:	Excessive level of carbon dioxide in the blood
Pronunciation:	high-per-CAP-nee-uh

Prefix	Root	Suffix
hyper: excessive, above	capnia: carbon dioxide	

Clinical Pearls:

- Hypercapnia, also called hypercarbia, describes a condition of excess carbon dioxide in the blood, which may be an indicator of inadequate respirations. Possible symptoms are shortness of breath, anxiety, headache, drowsiness, and confusion.
- Causes can include chronic obstructive pulmonary disorder (COPD), sleep apnea, metabolic disorders, and sedative overdose.
- Treatment will vary depending on the underlying condition but may involve oxygen, ventilation, or medications to open the airways.

HYPERCHOLESTEROLEMIA

Tags: Cardiology

Definition:	Excess levels of cholesterol in the blood
Pronunciation:	high-per-kohl-es-tur-uhl-EE-mee-uh

Prefix	Root	Suffix
hyper: excessive, above	cholesterol/o: cholesterol	-emia: blood, condition of blood

Clinical Pearls:

- Hypercholesterolemia is a type of hyperlipidemia, which describes excess cholesterol and LDL levels in the blood. Hypercholesterolemia can be genetic, but is more commonly due to lifestyle choices like poor diet, obesity, lack of exercise, and smoking.
- Normal cholesterol levels are as follows:
  - Total cholesterol should be < 200 mg/dL,
  - Low-density lipoprotein (LDL), or "bad cholesterol," should be < 100 mg/dL in most patients, and < 70 mg/dL in high-risk patients
  - High-density lipoprotein (HDL), or "good cholesterol" should be > 35 mg/dL
  - Triglycerides should be < 150 mg/dL
- If not managed, hypercholesterolemia can lead to atherosclerosis and increase the risk for heart disease, heart attack and stroke.
- Medications to manage hypercholesterolemia include atorvastatin, lovastatin, rosuvastatin, fenofibrate, gemfibrozil, and ezetimibe. Non-pharmacologic management involves healthy eating, exercise, managing weight, and quitting smoking.

HYPEREMESIS

Tags: Gastrointestinal

Definition: Excessive vomiting

Pronunciation: high-per-EM-uh-sis

Prefix	Root	Suffix
hyper: excessive, above	emesis: vomiting	

Clinical Pearls:

- Hyperemesis describes a condition of persistent and excessive vomiting and is commonly seen in pregnancy and known as hyperemesis gravidarum.
- Complications can include weight loss, dehydration, and electrolyte balance.
- Treatment may involve eating smaller more frequent meals, ginger and pyridoxine for nausea. Intravenous fluids and antiemetic medications may be used to manage nausea and vomiting.

HYPEREMIA

Tags: Hematology

Definition:	Excess blood flow to an organ
Pronunciation:	high-per-EE-mee-uh

Prefix	Root	Suffix
hyper: excessive, above		-emia: blood, condition of blood

Clinical Pearls:

- Hyperemia can affect numerous organs, such as the eyes, the brain, the skin, the stomach, or the heart. Symptoms and treatment will depend on the underlying cause and the organ affected but can include swelling, redness, and warmth.
- Hyperemia can be caused by vasodilation due to an increased demand for blood, such as with exercise, digestion, or injury. It can also occur due to blockage or organ dysfunction, such as heart failure or blood clots.

HYPERGLYCEMIA

Tags: Metabolic, Endocrinology

Definition:	Elevated blood glucose
Pronunciation:	high-per-gly-SEE-mee-uh

Prefix	Root	Suffix
hyper: excessive, above	glyc/o: glucose	-emia: blood, condition of blood

Clinical Pearls:

- Hyperglycemia, or elevated blood glucose, is seen in patients with diabetes, and if left untreated can lead to complications such as kidney disease, peripheral neuropathy, serious infections, vision problems, and heart attack. Symptoms of hyperglycemia include polydipsia, polyphagia, and polyuria.
- Normal blood glucose values are as follows:
  - Fasting blood glucose is between 70 and 100 mg/dL
  - Post prandial blood glucose, or blood glucose after meals, is < 140 mg/dL
- Treatment will require controlling blood sugar values to reduce symptoms and complications by eating healthy, exercising, as well as medications like insulin, metformin, glipizide, and pioglitazone to control blood glucose.
- Patients with diabetes, especially those on insulin, should check their blood glucose frequently to ensure they are within the appropriate blood glucose goals.

HYPERHIDROSIS

Tags: Endocrinology, Dermatology

Definition: Excessive sweating

Pronunciation: high-per-high-DRO-sis

Prefix	Root	Suffix
hyper: excessive, above	hydr: water	-osis: condition, abnormal state

Clinical Pearls:

- Hyperhidrosis is excessive sweating which is not related to exercise or high temperature.
- Causes of excessive sweating can include infections, hyperthyroidism, menopause, hot flashes, heart attack, diabetes, or hypoglycemia.
- Medications which can cause hyperhidrosis include hormone therapies (estrogen), antidepressants, and opioids (morphine).
- Management may involve use of antiperspirants, botulinum toxin injections to block nerves that cause sweating, and lifestyle modifications to promote dryness and hygiene.

HYPERKALEMIA

Tags: Metabolic

Definition: Above normal levels of potassium in the blood

Pronunciation: high-per-kaal-EE-mee-uh

Prefix	Root	Suffix
hyper: excessive, above	kal/i: potassium	-emia: blood, condition of blood

Clinical Pearls:

- Hyperkalemia is a potassium level > 5.0 and can be caused by increased potassium intake, decreased potassium excretion such as in kidney disease, or extracellular shifts of potassium. Hyperkalemia is associated with potentially fatal arrhythmias, muscle cramping, twitching, and weakness.
- Normal potassium levels are between 3.5 and 5.0 milliequivalents per liter (mEq/L).
- Maintaining potassium concentration is important for protein synthesis, cellular metabolism, and regulation of action potential across the cell membrane, including in the heart.
- Medications which can increase potassium include angiotensin-converting enzyme (ACE) inhibitors (such as lisinopril and ramipril), angiotensin receptor blockers (ARB)/antagonists (such as losartan and olmesartan), spironolactone, and trimethoprim/sulfamethoxazole.
- Patients on multiple medications which can increase potassium may require frequent monitoring, or adjustment to their medications, especially if they have renal dysfunction.
- Treatment options involve shifting potassium into the cell with albuterol, insulin, and sodium bicarbonate or excretion of potassium with furosemide, sodium polystyrene sulfonate, and hemodialysis. Patients with hyperkalemia may also be given intravenous calcium gluconate to protect the heart.

HYPERLIPIDEMIA

Tags: Metabolic, Cardiology

Definition: Above normal levels of lipids in the blood

Pronunciation: high-per-lih-puh-DEE-mee-uh

Prefix	Root	Suffix
hyper: excessive, above	lipid: fat	-emia: blood, condition of blood

Clinical Pearls:

- Hyperlipidemia, commonly known as high cholesterol, is a condition of excess lipid levels in the blood. Hyperlipidemia can be genetic, but is more commonly due to lifestyle choices like poor diet, obesity, lack of exercise, and smoking.
- Normal cholesterol levels are as follows:
  - Total cholesterol should be < 200 mg/dL
  - Low-density lipoprotein (LDL), or "bad cholesterol," should be < 100 mg/dL in most patients, and < 70 mg/dL in high-risk patients
  - High-density lipoprotein (HDL), or "good cholesterol" should be > 35 mg/dL
  - Triglycerides should be < 150 mg/dL
- If not managed, hyperlipidemia can lead to atherosclerosis and increase risk for heart disease, heart attack and stroke.
- Medications to manage high cholesterol include atorvastatin, lovastatin, rosuvastatin, fenofibrate, gemfibrozil, and ezetimibe. Non-pharmacologic management involves healthy eating, exercise, managing weight, and quitting smoking.

HYPERMAGNESEMIA

Tags: Metabolic

Definition:	Higher than normal levels of magnesium in the blood
Pronunciation:	high-per-mag-nuh-ZEE-mee-uh

Prefix	Root	Suffix
hyper: excessive, above	magnes/o: magnesium	-emia: blood, condition of blood

Clinical Pearls:

- Hypermagnesemia is associated with potentially fatal cardiovascular and neurologic complications. Maintaining magnesium concentration is important for cellular and cardiac function. Symptoms include muscle weakness, paralysis, heart block, and death.
- Hypermagnesemia is a magnesium > 2.3 mg/dL and is often caused by renal failure. Normal magnesium levels are between 1.3 and 2.3 mEq/L.
- Lithium is a common medication-related cause of hypermagnesemia.

HYPERNATREMIA

Tags: Metabolic

Definition: Above normal levels of sodium in the blood

Pronunciation: high-per-nuh-TREE-mee-uh

Prefix	Root	Suffix
hyper: excessive, above	natr/o: sodium	-emia: blood, condition of blood

Clinical Pearls:

- Hypernatremia refers to a sodium level > 145 mEq/L. Symptoms of hypernatremia can range from mild to severe and include lethargy, weakness, confusion, seizure, coma, and death.
- Normal sodium levels are 135-145 mEq/L.
- The fluid status of a patient is important in managing water and electrolyte balance
- Management will vary depending on whether the patient has hypovolemic, euvolemic, or hypervolemic hypernatremia.
- Sodium correction should not exceed more than 6-12 mEq/L in a 24-hour period of time to avoid risk of osmotic demyelination syndrome, a serious neurological complication caused by rapid sodium correction.

HYPERPARATHYROIDISM

Tags: Endocrinology

Definition:	Condition of above normal parathyroid hormone levels
Pronunciation:	high-per-pair-uh-THY-roy-dih-zum

Prefix	Root	Suffix
hyper: excessive, above	parathyroid: parathyroid gland	-ism: process, condition

Clinical Pearls:

- Hyperparathyroidism is when parathyroid hormone levels exceed the upper limit of normal, leading to hypercalcemia and can be caused by a benign or malignant tumor, vitamin D or calcium deficiency, or chronic kidney disease.
- The four parathyroid glands, located next to the thyroid gland, regulate calcium levels. Normal parathyroid hormone levels are between 10 and 60 ng/L.
- When necessary, the parathyroid gland releases parathyroid hormone to increase calcium levels by releasing calcium from the bones into the bloodstream, increasing gastrointestinal absorption of calcium, and decreasing excretion of calcium from the kidneys.
- Symptoms can include weak bones and osteoporosis, kidney stones, trouble concentrating, weakness, loss of appetite, and constipation.
- Treatment may involve surgery to remove the glands if symptoms are causing health problems. Patients with hyperparathyroidism should also be screened regularly for osteoporosis.

HYPERPHOSPHATEMIA

Tags: Metabolic

Definition: Above normal levels of phosphate in the blood

Pronunciation: high-per-foss-fuh-TEE-mee-uh

Prefix	Root	Suffix
hyper: excessive, above	phosphat/o: phosphate	-emia: blood, condition of blood

Clinical Pearls:

- Hyperphosphatemia is a phosphate level > 4.5 and is commonly caused by renal insufficiency and hypoparathyroidism. Clinical presentation can include precipitation of calcium and phosphate crystals in the tissues and joints, gastrointestinal effects, and lethargy.
- Maintaining phosphate levels is important for bone health, nerve conduction, and muscle function. Normal calcium levels are between 2.5 and 4.5 mg/dL.
- Management may involve limiting phosphate intake, such as meat, dairy, and dark soda, as well as treatment with phosphate binders such as calcium carbonate, calcium citrate, lanthanum carbonate, or sevelamer.

HYPERPIGMENTATION

Tags: Dermatology

Definition:	Darker patches of skin due to excess pigment production
Pronunciation:	high-per-pig-men-TAY-shun

Prefix	Root	Suffix
hyper: excessive, above	pigment: color	ation: action or process

Clinical Pearls:

- Hyperpigmentation can be caused by hormonal changes, increased melanin production, or due to certain medications.
- Hyperpigmentation can be an adverse effect of medications including hydroxychloroquine, minocycline, and emtricitabine. In some cases, darkening may fade over time on its own; additional topical treatments may be needed to reduce dark spots.
- Latanoprost and travoprost, eyedrops used for the treatment of glaucoma, can cause hyperpigmentation of the iris. Patients should be counseled on this potentially permanent adverse effect.
- Wearing sunscreen and protective clothing, as well as avoiding medications which can cause pigmentation can help prevent hyperpigmentation.

HYPERPLASIA

Tags: Miscellaneous

Definition: Growth of an organ or tissue due to excess cell proliferation

Pronunciation: high-per-PLAY-zhuh

Prefix	Root	Suffix
hyper: excessive, above	plasia: growth, development	

Clinical Pearls:

- There are many different types of hyperplasia based described based on their location.
- Gingival hyperplasia is overgrowth of gum tissue which can be caused by poor oral hygiene or as an adverse effect of medications such as phenytoin and verapamil.
- Endometrial hyperplasia is growth of the uterus lining, which is caused by too much estrogen and not enough progesterone. Medroxyprogesterone or progesterone can be given for treatment of estrogen induced endometrial hyperplasia.
- Benign prostatic hyperplasia is enlargement of the prostate gland, which is common in older men, and can cause urinary symptoms such as frequent need to urinate, weak steam, and incomplete emptying of the bladder. Treatment options include doxazosin, terazosin, dutasteride, finasteride, and tamsulosin.

HYPERPROLACTINEMIA

Tags: Endocrinology

Definition: Above normal levels of prolactin in the blood

Pronunciation: high-per-pro-lak-tin-EE-mee-uh

Prefix	Root	Suffix
hyper: excessive, above	prolactin: hormone made by the pituitary gland	-emia: blood, condition of blood

Clinical Pearls:

- Prolactin stimulates the growth of mammary glands in the breast and production of breast milk. It is normal in pregnant women but can otherwise be caused by tumors, disease, or medications.
- Dopamine inhibits production of prolactin. Medications which inhibit dopamine, such as metoclopramide, quetiapine, and risperidone, can have an adverse effect of hyperprolactinemia.
- Treatment will target the underlying cause and may involve dopamine agonists like bromocriptine, radiation, or surgery.

HYPERPYREXIA

Tags: Immunology

Definition: An excessively high fever

Pronunciation: high-per-pie-REX-ee-uh

Prefix	Root	Suffix
hyper: excessive, above	pyrex: fever	-ia: condition

Clinical Pearls:

- Hyperpyrexia is commonly caused by bacterial or viral infections, and is an emergent medical condition. Symptoms include an excessively high fever, shivering, seizures, confusion or mental changes, increased heart rate, and rapid breathing.
- Normal body temperature is between 98 and 98.6°F. A fever is a temperature above the normal range. Hyperpyrexia is a fever of > 106.7°F.
- Hyperpyrexia does respond to antipyretics, unlike hyperthermia.

HYPERREFLEXIA

Tags: Musculoskeletal

Definition: Overactive reflexes

Pronunciation: high-per-ruh-FLEX-ee-uh

Prefix	Root	Suffix
hyper: excessive, above	reflex: action or movement of body	-ia: condition

Clinical Pearls:

- Hyperreflexia can describe overactive reflexes, such as twitching or spasms and can be caused by spinal cord injury, underlying disease, or medications.
- Medications which can cause hyperreflexia include citalopram, desvenlafaxine, rizatriptan, sertraline, and vilazodone.
- Treatment involves addressing the underlying condition, and removing any medications which can be causing symptoms.

HYPERSECRETORY

Tags: Miscellaneous

Definition:	Excessive production of bodily secretions
Pronunciation:	high-per-suh-KREE-tor-ee

Prefix	Root	Suffix
hyper: excessive, above	secretory: promoting secretion	

Clinical Pearls:

- A condition of excessive production of bodily secretions, such as stomach acid, or different types of hormones (eg, growth hormone, cortisol).
- A common condition is gastric hypersecretion, in which increased production of stomach acid can increase risk for peptic ulcer disease, gastroesophageal reflux disease (GERD), and stomach bleeds.
- Treatment will address the excessive production. For gastric hypersecretion, management will include medications which decrease stomach acid production, such as proton pump inhibitors (pantoprazole and omeprazole).

HYPERTENSION

Tags: Cardiology

Definition:	Elevated blood pressure
Pronunciation:	high-per-TEN-shun

Prefix	Root	Suffix
hyper: excessive, above		-tension: pressure

Clinical Pearls:

- Hypertension is a common condition, which is often asymptomatic, but if left untreated can increase risk for heart attack, heart failure, and stroke.
- A normal blood pressure is less than 120/80 mmHg.
- Hypertension can be caused by drugs, medications, lifestyle factors, genetics, or other conditions such as sleep apnea, thyroid disease, or kidney disease.
- Medications which can increase blood pressure include non-steroidal anti-inflammatory drugs (NSAIDs), estrogen, decongestants like pseudoephedrine, or stimulants like amphetamine.
- Lifestyle modifications to reduce blood pressure involve reducing sodium intake, increasing exercise, losing weight, eating a diet high in fruits and vegetables, tobacco cessation and reducing alcohol and caffeine intake.
- There are many medications to reduce blood pressure. Selection of agent will depend on what is safe and effective for the patient, adverse effect profile, and comorbid conditions.

HYPERTHERMIA

Tags: Metabolic

Definition: Above normal body temperature

Pronunciation: high-per-THUR-mee-uh

Prefix	Root	Suffix
hyper: excessive, above	therm: heat	-ia: condition

Clinical Pearls:

- Hyperthermia is a high body temperature caused by producing heat faster than the body can regulate it, such as in extreme temperatures or with strenuous exercise. Dehydration can also contribute. In addition to fever, symptoms of hyperthermia can include confusion, hypotension, dehydration, hot skin, and delirium.
- Normal body temperature is between 98 and 98.6°F. A fever is a temperature above the normal range.
- Medications that cause hyperpyrexia include buspirone, citalopram, desvenlafaxine, duloxetine, escitalopram, and sertraline.
- Treatment of hyperthermia involves cooling techniques and addressing the underlying cause. Hyperthermia does not respond to antipyretics, unlike hyperpyrexia.

HYPERTHYROIDISM

Tags: Endocrinology

Definition: Over production of thyroid hormone caused by an overactive thyroid gland

Pronunciation: high-per-THI-roid-izm

Prefix	Root	Suffix
hyper: excessive, above	thyroid/o: thyroid gland	-ism: process, condition

Clinical Pearls:

- Hyperthyroidism, or the condition of being hyperthyroid, is the result of increased thyroid hormone production at the thyroid gland. Hyperthyroidism is commonly caused by Grave's disease but can also be caused by thyroiditis, or inflammation of the thyroid.
- Symptoms of hyperthyroidism include tachycardia, palpitations, weight loss, difficulty sleeping, sensitivity to heat and sweating, anxiety, brittle hair, and lighter or skipped periods.
- Hyperthyroidism is defined as a decrease in serum Thyroid Stimulating Hormone (TSH) to less than 0.35 mIU/L with either a normal or high level of free thyroxine (T_4)—as defined by a $T_4 > 12$ mcg/dL.
- Treatment of hyperthyroidism includes medications to slow the production of thyroid hormone like methimazole and propylthiouracil, radioactive iodine to ablate the thyroid, or surgery to remove the thyroid.

HYPERTRICHOSIS

Tags: Endocrinology

Definition: An abnormal condition of excessive hair growth

Pronunciation: high-per-trik-OH-sis

Prefix	Root	Suffix
hyper: excessive, above	trich/o: hair	-osis: condition, abnormal state

Clinical Pearls:

- Hypertrichosis describes a condition of excessive hair growth which can affect both men and women.
- Unlike hirsutism, it can occur anywhere on the body. It may be congenital, or an adverse effect of medications like phenytoin. Treatment options are limited and involve hair removal.

HYPERTRIGLYCERIDEMIA

Tags: Cardiology

Definition: Above normal triglyceride levels in the blood

Pronunciation: high-per-try-glih-sur-ide-EE-mee-uh

Prefix	Root	Suffix
hyper: excessive, above	triglyceride: a type of fat found in the body	-emia: blood, condition of blood

Clinical Pearls:

- Hypertriglyceridemia, commonly known as high cholesterol, is a condition of excess lipid levels in the blood.
  - Triglycerides should be < 150 mg/dL
- Hypertriglyceridemia can be genetic, but is more commonly due to lifestyle choices like poor diet, obesity, lack of exercise, and smoking.
- Elevated triglyceride levels are associated with atherosclerosis and increased risk for heart disease, heart attack and stroke. Patients with triglycerides > 500 mg/dL are at increased risk for pancreatitis.
- Medications to manage high triglycerides include atorvastatin, lovastatin, rosuvastatin, fenofibrate, gemfibrozil, ezetimibe, fish oil, and niacin. Non-pharmacologic management involves healthy eating, exercise, managing weight, and quitting smoking.

HYPERURICEMIA

Tags: Metabolic

Definition: Above normal levels of uric acid in the blood

Pronunciation: high-per-yoo-rih-SEE-mee-uh

Prefix	Root	Suffix
hyper: excessive, above	uric: uric acid	-emia: blood, condition of blood

Clinical Pearls:

- Uric acid is produced when the body breaks down amino acids found in some foods. It is commonly excreted through the urine and stool.
- A normal uric acid level is between 3 and 6 mg/dL.
- High uric acid levels (> 7 mg/dL) are an indicator of disease, such as gout, kidney disease, or tumor lysis syndrome.
- Symptoms of gout can include formation of kidney stones, or uric acid crystals in the joints (gout) which can cause redness, pain, stiffness, and swelling of the joints.
- Medications which can cause high uric acid levels include diuretics such as chlorthalidone, furosemide, and hydrochlorothiazide.
- Treatment will depend on the clinical presentation but may involve decreasing uric acid by managing diet and prescribing medications like xanthine oxidase inhibitors (allopurinol or febuxostat), many patients will require acute treatment with NSAIDs (indomethacin), steroids (prednisone) and/or colchicine for pain management.

HYPERVOLEMIA

Tags: Miscellaneous

Definition:	Excess fluid in the blood, or fluid overload
Pronunciation:	high-per-voh-LEE-mee-uh

Prefix	Root	Suffix
hyper: excessive, above	vol: volume	-emia: blood, condition of blood

Clinical Pearls:

- Hypervolemia describes a condition of excess fluid in the blood volume. The fluid status of a patient is important in managing water and electrolyte balance, such as sodium.
- A patient with hypervolemic hyponatremia will have impaired fluid excretion, leading to a relative decrease in sodium concentration, or a dilutional effect. This is commonly seen in patients with heart, kidney, or liver failure.
- Treatment will require addressing the underlying cause, restricting water intake, and may involve removing excess fluid with a loop diuretic, such as furosemide.
- A patient with hypervolemic hypernatremia will have an increase in both sodium and fluid status, with a relatively greater increase in sodium. This is commonly seen when administering intravenous 3% sodium chlorine or dialysis solution.
- Treatment will involve a loop diuretic to remove excess sodium, and correction of fluid status using D_5W.

HYPOCALCEMIA

Tags: Metabolic

Definition:	Lower than normal levels of calcium (Ca^{++}) in the blood
Pronunciation:	high-poh-caal-SEE-mee-uh

Prefix	Root	Suffix
hypo: deficient, under	calc/o: calcium	-emia: blood, condition of blood

Clinical Pearls:

- Hypocalcemia is a calcium level less than 8.6 mg/dL and is commonly caused by vitamin D deficiency, hypomagnesemia, hyperphosphatemia, or hypoparathyroidism.
- Normal calcium levels are between 8.6 and 10.3 mg/dL.
- Calcium binds to albumin in the blood, so for patients with low levels of albumin, a corrected calcium may need to be calculated to ensure appropriate evaluation.
  - Corrected serum calcium = serum calcium + (0.8 × [4-serum albumin])
- Maintaining calcium concentration is important for bone health, nerve conduction, muscle contraction, and coagulation.
- Clinical presentation can range from asymptomatic to symptoms of muscle cramping, tetany, and paresthesia, anxiety, memory loss, and confusion.
- Bisphosphonates, such as alendronate, ibandronate, and risedronate, used in the treatment of osteoporosis are contraindicated in hypocalcemia as they decrease breakdown of bone and can worsen hypocalcemia.
- Treatment may involve administration of oral or intravenous calcium supplements, as well as vitamin D or calcitriol supplementation to increase absorption of calcium.

HYPOCORTISOLISM

Tags: Endocrinology

Definition: An endocrine disorder in which the adrenal gland produces low levels of cortisol

Pronunciation: high-poh-KOR-tuh-zal-izm

Prefix	Root	Suffix
hypo: deficient, under	cortisol: stress hormone	-ism: process, condition

Clinical Pearls:

- Hypocortisolism can be caused by damage to the adrenal gland, disease, or adrenal tumors.
- Symptoms of hypocortisolism include fatigue, weakness, salt craving, low blood pressure, low blood sugar, depression, and irritability.
- Medications used for treatment of hypocortisolism include steroids such as hydrocortisone, prednisone, methylprednisone, or fludrocortisone.

HYPOGLYCEMIA

Tags: Endocrinology

Definition:	Low blood glucose
Pronunciation:	high-poh-gly-SEE-mee-uh

Prefix	Root	Suffix
hypo: deficient, under	glyc/o: glucose	-emia: blood, condition of blood

Clinical Pearls:

- Hypoglycemia can be due to diabetes medications like insulin, skipping meals, or certain diseases which affect insulin production. Symptoms of hypoglycemia include dizziness, headache, shakiness, pale skin, hunger, anxiety, sweating, and irritability.
- Normal blood glucose values are as follows:
  - Fasting blood glucose is between 70 and 130 mg/dL
  - Post prandial blood glucose, or blood glucose after meals, is > 140 mg/dL
- Strategies to reduce hypoglycemia include eating small and frequent meals or snacks throughout the day.
- Patients with diabetes experiencing hypoglycemia should consume 15 grams of sugar and recheck their blood glucose within 15 minutes. It may be necessary to hold or adjust their diabetes medications in response to hypoglycemic events.
- Patients with diabetes should check their blood glucose frequently to ensure they are within appropriate blood glucose goals.

HYPOGONADISM

Tags: Endocrinology

Definition:	Low production of sex hormones by reproductive glands
Pronunciation:	high-poh-GOH-nad-iz-um

Prefix	Root	Suffix
hypo: deficient, under	gonad: reproductive gland	-ism: process, condition

Clinical Pearls:

- Hypogonadism can affect males and females, and can be genetic, or caused by autoimmune disease, injury, infection, or pituitary disease. Symptoms in males can include infertility, loss of body hair, erectile dysfunction, reduced growth of penis and testes, and breast growth.
- Clinical presentation in females can include lack of menstruation, low sex drive, absent breasts, and hot flashes
- Treatment will involve estrogen or testosterone replacement therapy.

HYPOHIDROSIS

Tags: Endocrinology, Dermatology

Definition: A decrease in sweat production

Pronunciation: high-poh-high-DRO-sis

Prefix	Root	Suffix
hypo: deficient, under	hydr: water	-osis: condition, abnormal state

Clinical Pearls:

- Hypohidrosis can be caused by local injury, trauma, infection, or radiation.
- Patients with hypohidrosis are not able to effectively regulate heat, so management options will include cooling measures.

HYPOKALEMIA

Tags: Metabolic

Definition:	Below normal levels of potassium (K^+) in the blood
Pronunciation:	high-poh-kaal-EE-mee-uh

Prefix	Root	Suffix
hypo: deficient, under	kal/i: potassium	-emia: blood, condition of blood

Clinical Pearls:

- Hypokalemia is a potassium level less than 3.5 mg/dL and can be caused by intracellular shifts of potassium which can be caused by administering insulin or albuterol, increased potassium loss such as with diuretics like furosemide or gastrointestinal loss, or decreased ingestion of potassium.
- Normal potassium levels are between 3.5 and 5.0 mg/dL. Maintaining potassium concentration is important for protein synthesis, cellular metabolism, and regulation of action potential across the cell member, including in the heart.
- Hypokalemia is associated with potentially fatal arrhythmias, nausea, vomiting, and weakness.
- Treatment options include oral or intravenous administration of potassium chloride or potassium phosphate. In patients with hypokalemia and hypomagnesemia, it is important to correct magnesium levels first.

HYPOLIPIDEMIA

Tags: Metabolic, Cardiology

Definition:	Below normal levels of lipids in the blood
Pronunciation:	high-poh-lih-puh-DEE-mee-uh

Prefix	Root	Suffix
hypo: deficient, under	lipid: fat	-emia: blood, condition of blood

Clinical Pearls:

- Hypolipidemia is uncommon and often asymptomatic. Because it is an indicator of underlying disease, management will focus on identifying and addressing the cause. Low lipid levels in the blood can be genetic or due to malignancy, malabsorption, or infection.
- Normal cholesterol levels are as follows:
  - Total cholesterol should be < 200 mg/dL,
  - Low-density lipoprotein (LDL), or "bad cholesterol," should be < 100 mg/dL in most patients, and < 70 mg/dL in high-risk patients
- Treatment involves dietary correction and supplementation to meet nutritional needs.

HYPOMAGNESEMIA

Tags: Metabolic

Definition:	Lower than normal levels of magnesium in the blood
Pronunciation:	high-poh-mag-nuh-ZEE-mee-uh

Prefix	Root	Suffix
hypo: deficient, under	magnes/o: magnesium	-emia: blood, condition of blood

Clinical Pearls:

- Hypomagnesemia is associated with potentially fatal arrhythmias, seizures, and coma. Maintaining magnesium concentration is important for cellular and cardiac function.
- Hypomagnesemia is a magnesium level less than 1.3 mg/dL and can be caused by gastrointestinal or renal loss.
- Normal magnesium levels are between 1.3 and 2.3 mEq/L.
- Medications which can cause hypomagnesemia include diuretics like furosemide, hydrochlorothiazide, and torsemide; amphotericin; and aminoglycosides like amikacin and gentamycin.
- In patients with hypokalemia and hypomagnesemia, it is important to correct magnesium levels first.

HYPONATREMIA

Tags: Metabolic

Definition: A low amount of sodium in the blood below normally acceptable levels

Pronunciation: high-poh-NUH-tree-mee-uh

Prefix	Root	Suffix
hypo-: below, under	natr/o: sodium	-emia: blood, condition of blood

Clinical Pearls:

- Hyponatremia is a condition where the body is unable to maintain a standard water-sodium balance most often due to an inability for the kidney to appropriately excrete water. Symptoms include confusion, nausea, malaise, headache, and disorientation.
- Hyponatremia is defined as less than 135 mEq/L (mmol/L).
- Medications that are likely to cause hyponatremia include diuretics (including hydrochlorothiazide and chlorthalidone), and anticonvulsants (such as carbamazepine).
- Acute treatment of hyponatremiai includes the administration of intravenous sodium chloride.
- Treatment for common causes of hyponatremia, including the syndrome of inappropriate antidiuretic hormone secretion (SIADH), is restricting water intake, and identifying the root cause but can include vasopressin receptor antagonists (VRA) that includes conivaptan and tolvaptan.

HYPOPARATHYROIDISM

Tags: Endocrinology

Definition:	Below normal parathyroid hormone levels
Pronunciation:	high-poh-pair-uh-THY-roy-dih-zum

Prefix	Root	Suffix
hypo: deficient, under	parathyroid: parathyroid gland	-ism: process, condition

Clinical Pearls:

- Hypoparathyroidism is when parathyroid hormone levels fall below the lower limit of normal, often as the result of removal of the parathyroid gland, autoimmune disorders, or damage from radiation treatment among others.
- Normal parathyroid hormone levels are between 10 and 60 ng/L.
- Since the parathyroid gland releases parathyroid hormone to increase calcium levels by releasing calcium, hypoparathyroidism causes hypocalcemia, and the clinical presentation is similar.
- Treatment may involve administration of recombinant parathyroid hormone (rPTH), as well as vitamin D, calcium or calcitriol supplementation to increase absorption of calcium.

HYPOPHOSPHATEMIA

Tags: Metabolic

Definition:	Low number of phosphates in the blood
Pronunciation:	high-poh-FOS-fuh-tee-mee-uh

Prefix	Root	Suffix
hypo-: below, under	phosphat/o: phosphate	-emia: blood, condition of blood

Clinical Pearls:

- Hypophosphatemia is mainly caused by three mechanisms: issues of phosphate absorption in the gut, issues with reabsorption in the kidney, or lack of intake due to diet or other causes such as alcoholism. Other causes include chronic diseases such as vitamin D deficiency, hyperparathyroidism, and other disorders of the kidney and bone.
- Hypophosphatemia is defined as serum phosphate below 2.7 mg/dL (0.9 mmol/L) and severe hypophosphatemia is less than 1.5 mg/dL (0.5 mmol/L). Severe hypophosphatemia can result in various neurological and musculoskeletal symptoms including coma or death.
- Medications that can cause hypophosphatemia include phosphate-binding drugs (such as sucralfate), glucocorticoids, antivirals (such as emtricitabine/tenofovir disoproxil), diuretics, as well as other therapeutics that can redistribute phosphate such as insulin or erythropoietin.

HYPOTENSION

Tags: Cardiology

Definition:	Low, or decrease in, blood pressure
Pronunciation:	high-poh-TEN-shun

Prefix	Root	Suffix
hypo-: below, under	-tension: pressure	

Clinical Pearls:

- One of the most common causes of hypotension is orthostatic hypotension, which is a decrease is blood pressure when standing (orthostatic), of either systolic or diastolic blood pressure. Hypotension is also common for patients undergoing hemodialysis (HD) known as intradialytic hypotension (IDH).
- Hypotension is more common in older adults, patients with diabetes, severe volume depletion, and patients who are on hypertension medications. Common symptoms include dizziness, fainting, and nausea.
- Hypotension is most commonly clinically defined as a systolic blood pressure (SBP) of less than 90 mmHg and/or a diastolic blood pressure (DBP) of less than 60 mmHg.
- Medications used to treat hypotension include midodrine and fludrocortisone.
- Hypotensive-causing medications include most treatments for hypertension but medications such as nitrates, IV amiodarone, and phosphodiesterase inhibitors (such as sildenafil) can cause hypotension.
- Patients at high risk should be started on lower doses of antihypertensive medications and counseled to monitor symptoms associated with supratherapeutic doses.

HYPOTHYROIDISM

Tags: Endocrinology

Definition:	Low amount of thyroid gland activity
Pronunciation:	high-poh-THY-roy-diz-um

Prefix	Root	Suffix
hypo-: below, under	thyroid/o: thyroid gland	-ism: process, condition

Clinical Pearls:

- Hypothyroidism, or the condition of being hypothyroid, is the result of decreased thyroid hormone production at the thyroid gland. Hypothyroidism is defined as either primary hypothyroidism (such as Hashimoto's disease or Iatrogenic hypothyroidism) or secondary hypothyroidism (which includes pituitary or hypothalamic disease).
- Symptoms of hypothyroidism include weight loss, anxiety, heart palpitations, fatigue, and heat intolerance.
- Hypothyroidism is defined as a rise in serum Thyroid Stimulating Hormone (TSH) > 4.5 mIU/L with either a normal or low level of free thyroxine (T_4)—as defined by a T_4 less than 4.5 mcg/dL.
- The treatment of choice in hypothyroidism is levothyroxine (synthetic T4).

HYPOTRICHOSIS

Tags: Ocular, Dermatological

Definition: An abnormal lack of hair, often genetic in nature

Pronunciation: high-poh-tri-KOH-sis

Prefix	Root	Suffix
hypo-: below, under	trich/o: hair	-sis: state of, condition

Clinical Pearls:

- Hypotrichosis is a loss of hair growth that often occurs from a young age and can affect the scalp and other areas of the body.
- Hypotrichosis is most often referred to in terms of eyelash hypotrichosis that can occur as the result of genetic deficiencies or chemotherapy. Hypotrichosis often presents as brittle hair and patients are unable to grow hair to a normal length.
- The only FDA-approved treatment for hypotrichosis of the eyelashes is Bimatoprost. Patients apply therapy nightly to clean skin on the upper margin of the eyelid with a sterile applicator. Patients should be counseled that therapy can take at least 2 months of continuous application to begin to see improvements in eyelash growth.

HYPOVOLEMIA

Tags: Metabolic

Definition: A low amount of blood in the body

Pronunciation: high-poh-vol-EE-mee-uh

Prefix	Root	Suffix
hypo-: below, under	vol: volume	-emia: blood, condition of blood

Clinical Pearls:

- Hypovolemia can be caused by many factors and are a common cause of hypotension during hemodialysis. Hypovolemia is commonly found in sepsis.
- A form of hyponatremia, referred to as hypovolemic hypotonic hyponatremia, is commonly caused by thiazide diuretics such as hydrochlorothiazide and chlorthalidone. Treatment of hypovolemic hypotonic hyponatremia includes calculating the electrocellular fluid deficit and restoring appropriate volume and sodium while holding the offending agent.
- Multiple antihypertensive-therapies, including diuretics, are likely to increase the risk of hypotension due to hypovolemia.

HYPOXEMIA

Tags: Metabolic

Definition:	Low oxygen in the blood
Pronunciation:	high-pox-EE-mee-uh

Prefix	Root	Suffix
hypo-: below, under	ox/o: oxygen	-emia: blood, condition of blood

Clinical Pearls:

- Hypoxemia presents as a lack of oxygen in the blood and sometimes confused with *hypoxia*, which referred to a lack of oxygen to a specific part of the body. Hypoxemia commonly presents during an acute exacerbation of patients with COPD.
- Hypoxemia is defined as oxygen saturation less than 90% (0.90) and is associated with symptoms including shortness of breath, coughing, and tachycardia.
- Hypoxemia is treated with supplemental oxygen. Patients with a COPD exacerbation in advanced disease need overall aggressive oxygen therapy to avoid respiratory failure.

INFARCTION

Tags: Cardiology

Definition: Formation of an infarct, which is an area of dead tissue after a lack of blood supply

Pronunciation: in-FARK-shun

Prefix	Root	Suffix
	Latin origin: *infarctus*	-ion: process

Clinical Pearls:

- The most common clinical infarction occurs in the heart, called a Myocardial Infarction (MI), commonly referred to as a heart attack. MI is the result of reduced blood flood often as the result of a thrombus formation and the subsequent ischemia which can produce an infarction.
- Patients with suspected acute coronary syndrome (ACS) who are suspected to have an MI will most commonly present with chest pain that may radiate to the arms, abdomen, or other areas of the body.
- Patients will undergo a presenting electrocardiogram (ECG) and undergo the following laboratory tests: Cardiac troponin (cTn), blood chemistry (specifically magnesium and potassium), serum creatinine (SCr), along with a complete blood count (CBC), lipid panel, and coagulation tests.
- Medications used in the treatment of early MI include nitroglycerin, RAAS agent, heparin, oxygen, morphine, beta-blocker, and aspirin.
- MI is a rare by serious side effect of some medications including phosphodiesterase inhibitors (such as sildenafil).

ISCHEMIA

Tags: Hematology, Cardiology

Definition: Condition related to lack of blood flow, often described to various organs

Pronunciation: is-SKEE-mee-uh

Prefix	Root	Suffix
	isch/o: to hold back	-emia: blood, condition of blood

Clinical Pearls:

- Ischemia can occur anywhere arterial flow occurs in the body, but is often associated with acute myocardial ischemia that leads to myocardial infarction. Another very common example is used to classify the predominate form of stroke, an ischemic stroke, which is the lack of blood flow to the brain that results in neurologic manifestations. Ischemia can also occur in the kidney, gut, and other areas of the body.
- Patients with suspected MI will most commonly present with chest pain that may radiate to the arms, abdomen, or other areas of the body. Symptoms of ischemic stroke include a one-sided weakness, vision changes, trouble walking, and an inability to speak and/or understand.
- Patients with an ischemic stroke will undergo a computed tomography (CT) scan of the head to determine the resulting infarction along with magnetic resonance imaging (MRI) and an ECG if atrial fibrillation is present.
- Acute treatment for ischemic stroke includes alteplase and aspirin followed by corrections in volume to prevent hypotension. Secondary prevention includes antiplatelet agents such as clopidogrel, aspirin, and/or dipyridamole.

INCONTINENCE

Tags: Genitourinary

Definition:	Unable to control excretion of urine or feces
Pronunciation:	in-CON-tuh-nuhns

Prefix	Root	Suffix
in-: not	Latin origin (incontinent)	-ence: state of

Clinical Pearls:

- Incontinence can occur with urine (referred as urinary incontinence) and feces (fecal incontinence).
- Urinary incontinence (UI) is common and is related to either urethral underactivity, overactivity of the bladder, or urinary retention. Symptoms range from changes in urgency and frequency and changes in urine stream.
- UI is monitored based on patient-reported symptoms but tests such as a cough stress test, urodynamic studies, and possible catheterization are used to diagnose the specific type of incontinence. Renal and urinalysis tests are performed to rule out alternate causes.
- Patients should always employ non-pharmacologic interventions including pelvic floor muscle training first and concurrent with pharmacotherapy due to efficacy. Medications used to treat UI are called antimuscarinics such as oxybutynin and tolterodine. Longer-acting agents will often have increased tolerability. Other options include Mirabegron, a beta-adrenergic agonist reserved for patients unable to tolerate initial therapy.
- Patients with UI should avoid anticholinergic medications such as diphenhydramine due to their potential to cause UI.

JAUNDICE

Tags: Gastrointestinal

Definition: A yellowing of the eyes, skin, or tissue as the result of hepatotoxicity as a sign of too much bilirubin in the blood

Pronunciation: JON-duhs

Prefix	Root	Suffix
	non-constructed medical term	

Clinical Pearls:

- Patients who experience a rise in bilirubin as a result of alcohol intake, liver diseases (such as hepatitis), or medication-related causes. Symptoms include a yellow appearance in the skin and eyes and patients experience pruritis, nausea, and stool discoloration.
- Medications, such as fenofibrate, lacosamide, levetiracetam, lovastatin, and methotrexate among others may cause hepatic damage.
- Patients with excessive alcohol use should avoid medications which increase risk of liver damage. Pharmacists can screen medication lists to identify hepatotoxic medications, as well as medications which require hepatic dose adjustment.

KERATITIS

Tags: Ocular

Definition: Inflammation of the cornea

Pronunciation: ker-uh-TYE-tus

Prefix	Root	Suffix
	kerat/o: cornea	-itis: inflammation

Clinical Pearls:

- Keratitis, or inflammation of the cornea can be a cause of blindness due to the risk of injury to the cornea, often caused by infection. This is more likely to occur in those that wear contacts.
- Keratitis is a rare but serious side effect of many ophthalmic preparations including bimatoprost, lantanoprost, olopatadine, and ketotifen. Patients should be counseled to wash their hands prior to use of these agents and pay careful attention to ensure the dropper remains sterile by not wiping, touching, or placing in or around the eye.

KETOACIDOSIS

Tags: Metabolic

Definition: A condition in which high levels of blood acids, called ketones, buildup in the body.

Pronunciation: key-toh-ah-sid-OH-sis

Prefix	Root	Suffix
keto: ketones	acid (Latin origin)	-osis: condition, abnormal state

Clinical Pearls:

- While acidosis can present as a respiratory or metabolic disorder, ketoacidosis is commonly associated with the uncontrolled hyperglycemia, referred to a diabetic ketoacidosis (DKA) that can be life-threatening if not controlled.
- DKA is more common in patients with type I than type II diabetes due to an inability to produce insulin, but it can occur in the presence of significant hyperglycemia regardless of diagnosis. Other common symptoms including anion gap acidosis and ketonuria.
- Treatment is to restore appropriate metabolic and volume deficits for sodium and potassium and intravenous insulin. Providers should be careful to not to decrease blood glucose too rapidly due to the risk of cerebral edema.

LEUKEMIA

Tags: Hematology, Oncology

Definition: A group of malignancies originating in the bone marrow, characterized by abnormal white cell production

Pronunciation: lew-KEE-mee-uh

Prefix	Root	Suffix
	leuk/o: white	-emia: blood, condition of blood

Clinical Pearls:

- Leukemias are characterized as either acute or chronic and are defined by the origin of white blood cells (myeloid or lymphocytic). Therefore, the four types of leukemias are as follows: acute lymphocytic leukemia (ALL), chronic lymphocytic leukemia (CLL), acute myeloid leukemia (AML), and chronic myeloid leukemia (CML).
- Patients' symptoms vary based on the type of leukemia (ALL or AML) which may include fatigue, anemia, bruising, bone pain, and/or possible infection. Most patients, including chronic leukemias, are diagnosed based on the complete blood count.
- Laboratory values used in the diagnosis of leukemia are used to assess anemia, leukopenia or leukocytosis, and thrombocytopenia.
- Primary treatment for ALL includes vincristine, a glucocorticoid (such as prednisone), and pegaspargase. The most common treatment for AML includes an anthracycline (daunorubicin) along with cytarabine. Mitoxantrone has also been used in place of daunorubicin among other combinations used to prolong survival.
- Primary treatment for CML is busulfan and hydroxyurea. CLL is treated with an alkylating agent (cyclophosphamide) with or without corticosteroids.

LEUKOPENIA

Tags: Immunology

Definition:	Deficiency of white blood cells
Pronunciation:	lew-koh-PEE-nee-uh

Prefix	Root	Suffix
	leuk/o: white	-penia: deficiency

Clinical Pearls:

- Leukopenia, or low white blood cells can occur as the result of malignancies, but is often the result of an infectious disease, adverse reaction to drug therapy, or response to radiation treatment.
- Leukopenia is defined as a white blood cell count (WBC) less than WBC < 4500 cells/mm^3 (4.5×10^9/L)
- Various immunosuppressants such as azathioprine and cyclosporin, chemotherapeutics such as carboplatin, antibiotics such as ceftriaxone, antifungals such as amphotericin B, antithyroid medications such as methimazole among others. It is also a rare but serious side effect of other medications such as lamotrigine.

LIPOATROPHY

Tags: Metabolic

Definition: Loss of subcutaneous fat

Pronunciation: lie-poh-AH-troh-fee

Prefix	Root	Suffix
	lip/o: fat, lipid	-atrophy: without nourishment

Clinical Pearls:

- Lipoatrophy is changes and loss of subcutaneously fat that can occur both locally and throughout the body. It is commonly associated with medication use or adverse events.
- Lipoatrophy of the face is commonly associated with Human Immunodeficiency Virus (HIV) as to common side effect of early Antiretroviral therapy (ARV) therapy such as stavudine.
- Administration of insulin can cause lipoatrophy when the insulin reacts and destroys the fat the injection site. This is often caused by the lack of subcutaneous rotation sites over time. Patients should be counseled to rotate sites.

LYMPHOCYTOPENIA

Tags: Immunology

Definition:	Decrease in the number of lymphocytes in the blood
Pronunciation:	lym-fo-sigh-toh-PEE-nee-uh

Prefix	Root	Suffix
lymph/o: lymph	cyt/o: cell	-penia: deficiency

Clinical Pearls:

- Lymphocytopenia is a lack of lymphocytes in the blood stream which are made up of B lymphocytes, T lymphocytes, and natural killer (NK) cells. Lymphocytopenia can occur in multiple ways but is either inherited or acquired. Inherited lymphocytopenia is rare. Acquired lymphocytopenia can be caused by certain infectious diseases, autoimmune diseases, and/or various chemotherapeutics, including steroids.
- Lymphocytopenia is considered less than 1000 cells/mm^3 (1.0×10^9/L) in adults and less than 3000 cells/mm^3 (3.0×10^9/L) in children.

LYMPHOMA

Tags: Hematology, Oncology

Definition:	Tumor of the lymph nodes
Pronunciation:	lym-FOH-muh

Prefix	Root	Suffix
	lymph/o: lymph	-oma: tumor, mass

Clinical Pearls:

- Lymphomas are tumors that are the result of malignancies in the immune cells related to lymphoid tissue. Lymphomas are classified as either Hodgkin lymphoma (HK) or non-Hodgkin lymphoma (NHL) based on the immune cell affected.
- Patients with HL typically present with fever, malaise, and pruritus along with enlarged lymph nodes. NHL is similar in presentation, but a significant number of patients with peripheral lymphadenopathy, which are chronically swollen lymph nodes.
- All patients will undergo a complete blood count (CBC), chemical electrolyte panel, along with kidney and liver function tests.
- Treatment for NHL is varied based on complexity and aggressiveness of the disease and can involve one or more chemotherapeutics. A common combination for advanced disease includes the R-CHOP regimen (Rituximab, Cyclophosphamide, Doxorubicin, Vincristine, and Prednisone). Radiation may be used for localized disease.
- HL treatment consists of combination chemotherapy with radiation based on the stage of disease. Common combinations for HL include ABVD (Doxorubicin [anthracycline], Bleomycin, Vinblastine, Dacarbazine) along with Stanford V and BEACOPP as primary regimens.

MALAISE

Tags: Neurology

Definition:	General feeling of weakness
Pronunciation:	muh-LAYS

Prefix	Root	Suffix
	mal-: bad	-ise: condition of

Clinical Pearls:

- Malaise is a general unwell feeling. Although commonly associated with the onset of influenza infection, malaise presentation alone is not specific for influenza infection, but it is often abrupt and combined with fever, headache, sore throat, and muscle pain for hallmark symptoms of influenza infection.
- Malaise is not directly treated by therapeutics but managed with supportive care in a larger treatment plan to treat the underlying causative condition.
- Medications that can cause malaise include chemotherapeutics (such as vinblastine among others), and antivirals (valacyclovir, foscarnet). Malaise can also be commonly associated with immunizations often occurring up to 24-48 hours after the initial vaccination.

MALIGNANT

Tags: Oncology

Definition: Uncontrolled spread of death or disease, often referring to a tumor

Pronunciation: muh-LIG-nunt

Prefix	Root	Suffix
mal-: bad	Latin origin (malignant)	-ant: state of

Clinical Pearls:

- Malignant, often referring to the uncontrolled spread of the body, is applicable to the advanced form of cancer throughout the body. Similarly, the term malignancy, or malignancies for plural, refers to cancers, or cancer that occurs as the result of chemotherapy. These are referred to as *secondary malignancies*.
- The most commonly known secondary malignancies are acute myeloid leukemia (AML) and myelodysplastic syndromes (MDS) and can occur after a variety of successful treatments of various other cancers. Etoposide and anthracyclines (such as daunorubicin) have been associated with secondary leukemias.
- Malignancy is a very common FDA black box warning for many immunosuppressive medications in the treatment of other disorders. Medications including TNF-alpha inhibitors (such as adalimumab and etanercept) in the treatment of rheumatoid arthritis and other disorders. This is true for other therapies such as non-TNF biologic therapy abatacept as well as other immunosuppressants used for transplant such as tacrolimus among others.

MELANOMA

Tags: Oncology

Definition:	A dark tumor of the skin
Pronunciation:	meh-luh-NOH-muh

Prefix	Root	Suffix
melan/o: black	-oma: tumor, mass	

Clinical Pearls:

- Melanoma is the result of altered skin DNA as a result of exposure to ultraviolet (UV) rays. Patients who sunburn easily or are more likely to have UV exposure are at higher risk for the development of melanoma.
- Melanoma typically presents as a skin lesion that alters in appearance over time. Lesions often present in unique fashion: large, asymmetric, and dark in color. Sudden changes in lesions and or bleeding may be signs of melanoma.
- Patients with melanoma should have their lactate dehydrogenase (LDH) monitored as lower levels are linked to increased survival.
- If lesions are unable to be removed surgically, melanoma stage may determine the next step in treatment. Traditional chemotherapy is not often effective for metastatic melanoma. PD-1 inhibitors such as nivolumab or pembrolizumab are preferred over ipilimumab and patients with a BRAF mutation may benefit from dabrafenib/trametinib.

MENINGITIS

Tags: Infectious Disease

Definition: Inflammation of the meninges which are membranes that cover the brain and spinal cord

Pronunciation: men-in-JAI-tuhs

Prefix	Root	Suffix
	mening/o: meninges	-itis: inflammation

Clinical Pearls:

- Meningitis can be caused by either viruses or bacteria. Viral meningitis is more common and often does not result in symptomatic infection in healthy adults. Bacterial meningitis is less common but has significant morbidity and mortality associated with infection. While acute community-acquired bacterial meningitis can be caused by group B *Streptococcus*, *Neisseria meningitidis*, or *Haemophilus influenzae*, *Streptococcus pneumoniae*, which is the leading cause of infection in the United States.
- Patients often present with altered mental status, fever, headache, vomiting among others. While not specific for diagnosis, some patients present with a rigidity of the neck called 'nuchal rigidity' that won't allow patients to turn their head due to stiffness.
- While patients may present with fever, patients will need a cerebral spinal fluid (CSF) culture to diagnose bacterial meningitis and the causative pathogen. Patients should also have blood cultures before the start of empiric therapy.
- Medications used for the treatment of bacterial meningitis include vancomycin with cefotaxime or ceftriaxone along with ampicillin for older adults.
- The best way to prevent meningitis is to ensure adequate and complete vaccination, particularly for patients who are at high risk for infection.

MENORRHAGIA

Tags: Women's Health

Definition: Abnormal or excessive menstrual bleeding

Pronunciation: meh-noh-RAY-jee-uh

Prefix	Root	Suffix
	men/o: menses, menstruation	-rrhagia: bursting forth (of blood)

Clinical Pearls:

- Menorrhagia is now clinically referred to as heavy menstrual bleeding, or HMB.
- HMB is defined as blood loss of more than 80 mL in a menstrual cycle or bleeding that lasts > 7 days. HMB has a variety of potential causes including hematological disorders, cirrhosis, hypothyroidism, and alterations of the endometrium due to polyps' adenomyosis, or malignancy.
- Patients should undergo a complete blood count and potentially assessed for specific coagulation tests if hematological origin is suspected.
- A variety of combination oral contraceptives can be used to treat HMB. Estrogen is the recommended treatment to manage bleeding. Patients with contraindications to estrogen can use progestin-only regimens as well. Hormonal intrauterine device such as Mirena® may be particularly effective for patients who are not seeking to get pregnant or desire a long-term contraception formulation. NSAIDs such as ibuprofen can be administered during menses to reduce pain and blood less.

MUCOSITIS

Tags: Miscellaneous

Definition:	Inflammation of the mucous membrane
Pronunciation:	mu-koh-SIGH-tuhs

Prefix	Root	Suffix
	muc/o: mucus	-itis: inflammation

Clinical Pearls:

- Mucositis is a common adverse reaction in patients who receive radiation or chemotherapy. The resulting inflammation occurs as the mucosa of the gastrointestinal tract is altered which may result in the inability for the patient to eat or drink. Patients with head or neck cancers are at high risk, especially if radiation is used.
- Examples of chemotherapeutics include medications such as busulfan, melphalan, fluorouracil, paclitaxel, and methotrexate among others.
- Patients should maintain optimal oral hygiene to prevent mucositis, if possible and undergo frequent saltwater rinses during chemotherapy. Magic Mouthwash (aluminum hydroxide, diphenhydramine, and lidocaine) is often used. Magic Mouthwash may contain a combination of antihistamines, corticosteroids, antibiotic/antifungal, anti-inflammatory, topical anesthetics, and/or liquid antacid. Patients who have a fungal infection should be treated appropriately (eg, nystatin oral suspension for thrush).

MYALGIA

Tags: Musculoskeletal

Definition:	Pain in the muscle(s)
Pronunciation:	my-AL-jee-uh

Prefix	Root	Suffix
	my/o: muscle	-algia: pain

Clinical Pearls:

- Myalgias is classified under a large group of muscle disorders (myopathy) and refer to muscle aches, pains, and weakness often in larger muscle groups. Myalgias may also occur as the result of infection, electrolyte abnormalities, chemotherapy, or as a common adverse event to vaccinations.
- Myalgias are most commonly associated with statin therapy (atorvastatin, lovastatin, pravastatin, rosuvastatin, and simvastatin among others). Myalgias with statin therapy are managed by adjusting the dose of the statin or switching the statin as well as assessing for drug-drug and drug-food interactions that occur with statin use. Myalgias are different from the rare, serious muscle disorder called rhabdomyolysis.

MYCOSIS

Tags: Infectious Disease

Definition: Infection with a fungus, often associated with anatomical location

Pronunciation: my-KOH-suhs

Prefix	Root	Suffix
	myc/o: fungus	-sis: state of, condition

Clinical Pearl:

- Mycosis, or mycoses for plural, describe fungal infections that are sometimes referred to a mycotic, or of a fungal nature. Mycoses are very common infections and typically occur as vulvovaginal, onychomycosis (in addition to hair and skin infections), and esophageal candidiasis.

MYDRIASIS

Tags: Ocular

Definition: Dilation of the pupil of the eye with or without an attributed cause

Pronunciation: my-dree-UH-sis

Prefix	Root	Suffix
mydr/o-: wide		-iasis: abnormal condition

Clinical Pearls:

- Mydriasis, or a widening of the pupil, may occur in response to physical damage or in response to medications for medical or recreational use.
- Mydriasis is a common adverse event for patients who are using anticholinergics such as atropine.
- Some medications that cause mydriasis can affect intraocular pressure (IOP) which may affect patients with glaucoma, especially with closed angle glaucoma (CAG).
- Inducing mydriasis is common for certain ophthalmic procedures and exams, and the preferred agent is ophthalmic phenylephrine. Patients should be counseling not to drive or operate machinery after use.

MYELOMA

Tags: Oncology

Definition: A tumor of the bone marrow

Pronunciation: my-uh-LOH-muh

Prefix	Root	Suffix
	myel/o: spinal cord, bone marrow	-oma: tumor, mass

Clinical Pearls:

- Myeloma is most commonly referred to as multiple myeloma (MM) due to the typical clinical presentation that affected multiple bones in the body.
- While the exact cause of MM is unknown, it is more likely to affect men and older adults. Its primary presentation involved pain and degradation of bone. Patients can present with hypercalcemia and/or renal failure.
- Primary treatment for MM includes an antineoplastic agent such as lenalidomide as well as proteasome inhibitors such as carfilzomib or bortezomib. Patients often undergo hematopoietic stem cell transplantation (HSCT) if able to tolerate to increase survival.

MYELOSUPPRESSION

Tags: Immunology, Oncology

Definition:	Decrease in bone marrow production of red blood cells
Pronunciation:	my-eh-loh-su-PREH-shun

Prefix	Root	Suffix
	myel/o: spinal cord, bone marrow	-suppression: to stop

Clinical Pearls:

- Myelosuppression is a hallmark side effect of my agents used for chemotherapy. Bone marrow is responsible for the production of red and white blood cells as well as platelets.
- Examples of medications that have a black box warning for myelosuppression include busulfan, cisplatin, daunorubicin, and vinorelbine among others.
- Patients who undergo hematopoietic stem cell transplantation (HSCT) is often the result of patients to treat malignancies which would not be able to be treated due to myelosuppression-related dosing limits on chemotherapy.

MYOCARDITIS

Tags: Cardiology

Definition: Inflammation of the heart, specifically the myocardium (middle muscle of the heart wall)

Pronunciation: my-oh-car-DYE-tuhs

Prefix	Root	Suffix
my/o: muscle	cardi/o: heart	-itis: inflammation

Clinical Pearls:

- Myocarditis is a rare but can be responsible for a variety of suboptimal cardiovascular outcomes including sudden cardiac death, heart failure, and arrhythmias.
- Myocarditis can be caused by infections from viruses (more commonly associated with myocarditis), bacteria, parasites, and fungi.
- Conditions such as rheumatoid arthritis and systemic lupus erythematosus (SLE) may also cause myocarditis due to the result of the cardiovascular involvement of these conditions.
- Myocarditis is a known adverse effect of clozapine therapy and typically occurs within the first month of therapy. Other therapies that can cause myocarditis include anthracyclines such as daunorubicin and idarubicin.

MYOCLONUS

Tags: Neurology

Definition:	Involuntary contraction and relaxation of the muscles
Pronunciation:	my-AH-kluh-nuhs

Prefix	Root	Suffix
my/o: muscle	Greek origin (clonus): contract and relaxation of muscles	

Clinical Pearls:

- Myoclonus is commonly used clinically to describe a type of generalized seizure, and is used to describe the involuntary myoclonic (jerking or twitching) movements associated with convulsions.
- Myoclonus is a symptom of severe serotonin syndrome (SS) along with fever and central nervous system (CNS) instability. While not require for diagnosis, it is highly specific as a diagnosis of SS.
- Medications that affect serotonin in any way can increase risk for SS including antidepressants such as SSRIs or SNRIs. Often drug interactions with these agents cause SS such as giving along with MAO-I's such as Linezolid. Other medications that can cause myoclonus include tacrolimus as well as drug interactions that affect calcium channels include lamotrigine and escitalopram.

MYOPATHY

Tags: Musculoskeletal

Definition:	Disease of the muscle
Pronunciation:	my-AW-puh-thee

Prefix	Root	Suffix
	my/o: muscle	-pathy: disease

Clinical Pearls:

- Myopathy refers to the large group of injuries to muscle tissue, including, but not limited to myalgia. Myopathy is sometimes used interchangeability when discussing muscle pain with medications used for dyslipidemia (statins, fenofibrate, gemfibrozil, niacin) but also includes general muscle weakness.
- Myopathy with elevated creatine kinase (CK) levels may be a sign of the serious but rare muscle disorder called rhabdomyolysis.
- Myopathy is a known adverse reaction to chronic systemic glucocorticoid used for the treatment of rheumatoid arthritis and systemic lupus erythematosus (SLE).

NASOPHARYNGITIS

Tags: Infectious Disease

Definition:	Inflammation of the nose and pharynx
Pronunciation:	nay-zoh-fer-in-JAI-tuhs

Prefix	Root	Suffix
nas/o: nose	pharyng/o: throat (pharynx)	-itis: inflammation

Clinical Pearls:

- Nasopharyngitis is a common symptom associated with respiratory tract infections including acute bronchitis, invasive pneumococcal disease, and influenza infection.
- Nasopharyngitis is a known adverse reaction to many medications including many antidiabetic medications including DPP-4 inhibitors such as sitagliptin or saxagliptin, GLP-1 inhibitors including liraglutide, and inhaled medications such as budesonide/formoterol.
- Medications with high incidence of nasopharyngitis include abatacept for rheumatoid arthritis, PCSK9 inhibitors for familial hyperlipidemia (evolocumab), and antineoplastic agents including alemtuzumab and elotuzumab.
- Nasopharyngitis is typically treated by managing symptoms related to inflammation including decongestants (pseudoephedrine), expectorants (guaifenesin), and NSAIDs (ibuprofen).

NECROLYSIS

Tags: Dermatological

Definition: Loosening of necrosis

Pronunciation: nek-roh-LYE-suhs

Prefix	Root	Suffix
	necr/o: death	-lysis: loosening, separation, destruction, breakdown

Clinical Pearls:

- Necrolysis is clinically used most often in reference to toxic epidermal necrolysis (TEN)—a very severe dermatological reaction to medications that can cause intense blistering and loss of skin.
- TEN typically presents with other symptoms including nausea, vomiting, fever, malaise, and presents with a rash that can often develop into significant redness, bullae, and sloughing of skin. TEN can cause mucositis, hemorrhage, and ocular complications.
- TEN is often compared to Stevens-Johnson Syndrome (SJS), but TEN is more severe and differentiating more and more significant loss of skin.
- Medications are the primary cause of TEN/SJS, and examples include sulfa containing antibiotics such as Trimethoprim (TMP)/Sulfamethoxazole (SMZ). Other examples include anticonvulsants such as carbamazepine or lamotrigine, allopurinol for the treatment of gout, and proton pump inhibitors such as omeprazole.

NECROSIS

Tags: Miscellaneous

Definition:	Death of cells in tissue(s)
Pronunciation:	nek-ROH-suhs

Prefix	Root	Suffix
	necr/o: death	-sis: state of, condition

Clinical Pearls:

- Necrosis, specifically death of a group of cells in a tissue, can occur anywhere in the body and is typically defined by its anatomical prefix. Examples include acute tubular necrosis in the kidney, osteonecrosis in the bone, soft tissue necrosis with radiation and necrosis associated with pancreatitis.
- A group of immunosuppressants used in the treatment of rheumatic and dermatological disorders such as etanercept, adalimumab, and infliximab are referred to as tumor necrosis factor (TNF) alpha inhibitors, which is a cytokine that plays a role in the pathogenesis of these diseases.
- Purple glove syndrome is a rare but serious side effect that causes soft tissue necrosis of the hand or arm when infusing phenytoin as the possible result of extravasation at the IV site. Phenytoin should not be administered IM for this reason.

NECROTIZING

Tags: Infectious Disease

Definition: Caused or associated with necrosis

Pronunciation: NEK-roh-tie-zing

Prefix	Root	Suffix
	necr/o: death	-tizing: caused, associated

Clinical Pearls:

- While necrotizing refers to necrosis, clinically, it often refers to presence of soft tissue infections of which the most common is necrotizing fasciitis. Necrotizing fasciitis is a very serious infection of the tissue that often occurs as the result of surgery or trauma.
- Necrotizing fasciitis typically presents in acute fashion and is classified in three types based on status and severity of infection. Patients often present with fever and leukocytosis and the area of infection is painful, swollen, and hot to the touch. Patients should get cultured from the tissue sample as well as histology.
- Empiric treatment can be similar to cellulitis. Necrotizing fasciitis is treated empirically with vancomycin plus piperacillin-tazobactam. If the source is found to be type II or III, patients should be treated with penicillin with clindamycin.
- Necrotizing fasciitis is a rare but serious side effect of SGLT2 inhibitors used in the treatment of diabetes mellitus such as dapagliflozin.

NEPHRITIS

Tags: Genitourinary

Definition:	Inflammation of the kidneys
Pronunciation:	neh-FRY-tis

Prefix	Root	Suffix
	nephr/o: kidney	-itis: inflammation

Clinical Pearls:

- Nephritis is an inflammation of the kidney and often labeled by the area of injury and/or the disease process underlying the nephritis. Interstitial nephritis refers to renal interstitium and can be chronic or acute in nature. Lupus nephritis is a common manifestation of the larger disease process systemic lupus erythematosus (SLE) that is specific to the damage done to the kidney.
- Nephritis often presents as a form of nephrotoxicity. Acute interstitial nephritis (AIN) is caused by medications such as many antibiotics, loop diuretics such as furosemide, NSAIDs such as diclofenac, proton pump inhibitors (omeprazole), and ranitidine among others.
- Chronic interstitial nephritis can be caused by similar medication to AIN and include lithium, cyclosporine, and tacrolimus among others.

NEPHROLITHIASIS

Tags: Genitourinary

Definition: Calculus in the kidney, commonly referred to as kidney stones

Pronunciation: neh-fro-lih-THY-uh-sis

Prefix	Root	Suffix
nephr/o: kidney	lith/o: stone, calculus	-iasis: abnormal condition

Clinical Pearls:

- Nephrolithiasis is the formation of calculi in the kidney and are known as kidney stones. Nephrolithiasis can be drug-induced, but that is relatively rare compared to the overall rate of kidney stones.
- Nephrolithiasis is very painful and can cause infection, hematuria, and pyelonephritis.
- Medication-related causes include antiretroviral medications (specifically protease inhibitors such as atazanavir), triamterene, and nitrofurantoin among others.

NEPHROPATHY

Tags: Genitourinary

Definition:	Disease of the kidney
Pronunciation:	neh-FRAH-puh-thee

Prefix	Root	Suffix
	nephr/o: kidney	-pathy: disease

Clinical Pearls:

- Nephropathy is a broad term to describe diseases of the kidney but is used in conduction with drug induced kidney disease, such as analgesic nephropathy.
- Analgesic nephropathy is chronic interstitial nephritis that occurs as the result of overuse of analgesics such as NSAIDs. Analgesic nephropathy can present with nephrolithiasis and pyelonephritis and is notable for a significantly elevated serum creatinine with chronic administration of NSAIDs, especially with high doses of aspirin. It is treated by discontinuation of the offending agent and monitoring for renal complications.
- Medical conditions such as diabetes and hypertension commonly cause nephropathy.

NEPHROTOXICITY

Tags: Genitourinary

Definition:	Toxic to the kidney
Pronunciation:	neh-fro-tok-SIS-uh-tee

Prefix	Root	Suffix
nephr/o: kidney	toxic/o: poison	-ity: state of

Clinical Pearls:

- Nephrotoxicity refers to any toxicity in the kidney, often caused by drugs.
- Drug-induced nephrotoxicity refers often to a decrease in glomerular filtration rate (GFR) and result in increases serum creatinine as representative of general kidney injury and many biomarkers may determine the presence of disease.
- Nephrotoxicity is a common adverse reaction of many medications, especially if the mechanism of action occurs in the kidney. Often many of these medications may still be needed to care for the patient and require adjusting the dose to reduce the risk of damage to the kidney while maximizing therapeutic effect.

NEURALGIA

Tags: Neurology

Definition:	Pain associated with the nerves
Pronunciation:	nuh-RAL-juh

Prefix	Root	Suffix
	neur/o: nerve	-algia: pain

Clinical Pearls:

- Neuralgia can be acute or chronic pain that affects nerves. It is often described as a tingling or numbing sensation that presents jolts of pain in the face, arms, and legs and can be sensitive to touch.
- A form of neuralgia is postherpetic neuralgia, the most common complication of herpes zoster, or known as shingles. Shingles is a manifestation of the reactivation of the varicella-zoster virus (VZV), known as chicken pox.
- Postherpetic neuralgia associated with VZV can be prevented by vaccination including a recombinant zoster vaccine (RZV) indicated for adults 50 years of age and older.
- Medical conditions such as diabetes and kidney disease can cause neuralgia.
- Medication used to treat neuralgia is similar to neuropathy and include tricyclic antidepressants (amitriptyline), gabapentin, pregabalin, and localized pain treatment with lidocaine.

NEUROPATHY

Tags: Neurology

Definition:	Disease of the nerves
Pronunciation:	nuh-RAH-puh-thee

Prefix	Root	Suffix
neur/o: nerve		-pathy: disease

Clinical Pearls:

- Neuropathy refers to a group of diseases that cause pain by affecting the nervous system. Peripheral neuropathy is when the nerve pain affected extremities throughout the body including the hands, arms, face, as well as other areas of the body.
- Peripheral neuropathy is also a common complication of chronic uncontrolled hyperglycemia in patients with diabetes.
- Medication used to treat neuropathy is similar to neualgia and include tricyclic antidepressants (amitriptyline), gabapentin, pregabalin, and localized pain treatment with lidocaine.

NEUTROPENIA

Tags: Immunology

Definition:	Deficiency of neutrophils in the blood
Pronunciation:	new-TRUH-pee-nee-uh

Prefix	Root	Suffix
	neutr/o: neutrophil	-penia: deficiency

Clinical Pearls:

- Neutropenia is a disorder where there are a lack of neutrophils in the blood which put patients at a high risk for infection. Symptoms vary by bacterial, viral, or fungal infection, but the hallmark sign is fever.
- Severe neutropenia is defined as an absolute neutrophil count of less than 500 cells/mm^3 (0.5×10^9/L). Agranulocytosis is a form of severe neutropenia.
- Neutropenia can be caused or worsened by medications and is a possible rare but serious side effect of some medications. Examples include antibiotics, immunosuppressive therapies, antipsychotics, and chemotherapy among others.

NYSTAGMUS

Tags: Ocular

Definition:	Involuntary eyeball movement
Pronunciation:	nuh-STAG-mus

Prefix	Root	Suffix
	Greek origin (nystagmos)	

Clinical Pearls:

- Nystagmus is a unique ocular condition that results in involuntary movement of the eye (side to side, up and down, circular movement).
- Nystagmus can be either congenital or acquired and is more common in children. Vision changes are common and while it can't be cured, it is treated by correcting any vision changes and treating the underlying cause (if acquired).
- Nystagmus is a known adverse event of anticonvulsant medications including carbamazepine, lacosamide, phenytoin and topiramate as well as gabapentin, methocarbamol, ketamine, and benzodiazepines such as midazolam.

OLIGURIA

Tags: Genitourinary

Definition:	Scant urination
Pronunciation:	ol-ig-ur-EE-uh

Prefix	Root	Suffix
olig/o: scantly	-uria: urination, condition of urine	

Clinical Pearls:

- Oliguria when used as a clinical term refers to a decrease in urine output and is important to be monitored for patients in critical care.
- Oliguria is a potential sign of iron toxicity, and it has been associated with nephropathy and acute kidney injury.
- Oliguria is defined as urine output less than 0.5 mL/kg/hour in adults.
- Oliguria is a known side effect of lithium and tacrolimus.
- Patients are treated by restoring appropriate fluid balance and electrolyte balances while restoring appropriate urine output.

ONYCHOMYCOSIS

Tags: Infectious Disease

Definition:	Fungal infection of the nail
Pronunciation:	on-ih-KOH-my-koh-sees

Prefix	Root	Suffix
onych/o: nail	myc/o: fungus	-osis: condition, abnormal state

Clinical Pearls:

- Onychomycosis, also referred to as Tinea Unguium, is considered a form of superficial mycosis that affects the nail (finger or toe) and can be very difficult to treat. Toenails are more commonly affected than fingernails and are caused by *Trichophyton rubrum* and *mentagrophytes*. Patients who are older, immunosuppressed, smoking, and a history of onychomycosis are more likely to be affected.
- Onychomycosis commonly presents as a discoloration of the nail that often appears yellow, black, or discolored and can affect the surrounding skin. There are no lab values involved in diagnosis, but is severe cases, a culture may be collected.
- Patients may seek self-care for onychomycosis utilizing undecylenic acid, but these therapies are not effective. Therapy often takes many weeks or months to treat even after elimination of the offending pathogen. Topical therapy such as ketoconazole may be used; however, systemic therapy such as terbinafine or itraconazole is considered the most effective therapy with shortest duration.

OSTEOCLAST

Tags: Musculoskeletal

Definition:	Cells responsible for the breakdown of bone
Pronunciation:	AW-stee-oh-clast

Prefix	Root	Suffix
	oste/o: bone	-clast: to break

Clinical Pearls:

- Osteoclasts are cells that are responsible for the reabsorption of bone. While they are part of normal physiologic processes of bone formation along with osteoblasts—which help form bone—alternation of the process is responsible for decreases in bone mineral density (BMD).
- Osteoclasts are a specific target for medications called bisphosphonates used to treat osteoporosis including alendronate, ibandronate, and risedronate among others to alter the bone metabolism and slow the breakdown of the bone and increase density.

OSTEOMALACIA

Tags: Musculoskeletal

Definition:	Softening of the bone
Pronunciation:	aw-stee-oh-muh-LAY-juh

Prefix	Root	Suffix
	oste/o: bone	-malacia: softening

Clinical Pearls:

- Osteomalacia is a general clinical term for softening for the bones often due to deficiencies in vitamin D. Osteomalacia is more common in malnourished populations.
- Osteomalacia is often diagnosed as the result of multiple fractures or a diagnosis of Rickets disease in children which causes slow growth of bone, pain, and increased risk for fractures.
- Medications that affect bone strength include patients with antiretroviral (ARV) medications and those who required chronic glucocorticoids such as prednisone.
- All patients with osteomalacia should follow a healthy lifestyle to increase bone density including exercise, weight loss, and appropriate calcium and vitamin D supplementation/intake.

OSTEOMYELITIS

Tags: Infectious Disease

Definition: Infection of the bone marrow that may result in osteonecrosis

Pronunciation: aw-stee-oh-my-uh-LYE-tuhs

Prefix	Root	Suffix
oste/o: bone	myel/o: spinal cord, bone marrow	-itis: inflammation

Clinical Pearls:

- Osteomyelitis is a disorder of the bone caused by infection and is difficult to treat. Osteomyelitis can be caused from a variety of acute disorders including blunt trauma.
- Osteomyelitis is classified by duration (acute vs. chronic) or the origin of the infection: bloodstream (*Hematogeous osteomyelitis*) or surrounding tissue (*Contiguous osteomyelitis*).
- *Hematogeous* osteomyelitis is more likely to affect children while *Contiguous* osteomyelitis is more commonly found in adult over 50 years of age.
- Early administration of antibiotics is key to treatment and preventing acute osteomyelitis from becoming chronic. Empiric treatment of osteomyelitis includes a cephalosporin for children under 3 and vancomycin for adults. Typically, duration of antibiotic therapy, once the appropriate pathogen is identified, is 3-4 weeks.

OSTEONECROSIS

Tags: Musculoskeletal

Definition:	Necrosis of bone
Pronunciation:	aw-stee-oh-nek-ROW-sis

Prefix	Root	Suffix
oste/o: bone	necr/o: death	-sis: state of, condition

Clinical Pearls:

- Osteonecrosis can occur in any bone of the body causing severe pain and disability. Hips, knees, and shoulders are the most common sites affected.
- Osteonecrosis of the jaw is a rare but serious side effect of bisphosphonate medications including alendronate, ibandronate, and risendronate as well as other bone-modifying agents including denosumab.
- Other medication related causes for osteonecrosis include chronic use of glucocorticoids for the treatment of rheumatoid arthritis and induction therapy for various oncologic disorders including dexamethasone.

OSTEOPOROSIS

Tags: Musculoskeletal

Definition: Condition of bone degradation

Pronunciation: aw-stee-oh-puh-ROH-sis

Prefix	Root	Suffix
oste/o: bone	por/o: opening, passageway	-sis: state of, condition

Clinical Pearls:

- Osteoporosis is a chronic condition that results of low bone mineral density (BMD) that if left untreated can cause significant fractures.
- Osteoporosis does not have an obvious external clinical presentation but is often assessed after a bone fracture. Patients should be regularly screened for osteoporosis with an increased focus on older adults.
- First-line therapy includes bisphosphonate medications such as alendronate, ibandronate, and risendronate. Other therapies potentially include estrogen for postmenopausal osteoporosis prophylaxis. More advanced osteoporosis may be treated with agents including denosumab or infused zoledronic acid for patients unable to tolerate oral bisphosphonates.
- All patients should follow a healthy lifestyle to increase bone density including exercise, weight loss, and appropriate calcium and vitamin D supplementation/intake to reduce risk for osteoporosis.

OTALGIA

Tags: Miscellaneous

Definition:	Pain of the ear
Pronunciation:	oh-TAL-jee-uh

Prefix	Root	Suffix
	ot/o: ear	-algia: pain

Clinical Pearls:

- Otalgia is pain specific to the ear and a hallmark sign of acute otitis externa (AOE). AOE occurs after infections (such as otitis media) and the anatomy of the ear can play a role in therapy. AOE is commonly known as Swimmer's ear, but it doesn't have to be caused by water or swimming to be AOE.
- Otalgia is often present as a common symptom with itching, pain, or tenderness of the ear canal.
- Patients should be treated with appropriate antibiotic therapy such as ciprofloxacin with or without a combination steroid such as hydrocortisone or dexamethasone delivered as an eardrop for 7-10 days.
- Otalgia is a possible adverse reaction to intranasal corticosteroids such as mometasone. Patients should be counseled on appropriate administration technique to reduce the incidence of adverse reactions to therapy.

OTITIS

Tags: Miscellaneous

Definition:	Inflammation of the ear
Pronunciation:	oh-TIE-tis

Prefix	Root	Suffix
	ot/o: ear	-itis: inflammation

Clinical Pearls:

- Otitis refers to general inflammation of the ear but is most commonly associated with the diagnosis of *otitis media*. Otitis media is most often an acute ailment, but may also be classified as chronic as acute otitis media (AOM) is very common in children.
- Common pathogens associated with AOM include *Streptococcus pneumoniae* (*S. pneumoniae*) and *Haemophilus influenzae* (*H. influenzae*). Symptoms include fever, otalgia, and visible inflammation of the tympanic membrane.
- Patients should be treated with amoxicillin, amoxicillin-clavulanate, a cephalosporin antibiotic, or clindamycin if they have a penicillin allergy.
- Routine pneumococcal vaccination with PCV13 has shown to decrease the incidence of AOM visits and patients should receive four doses of the PCV13 vaccine as part of the routine pediatric vaccination series.

OTOTOXICITY

Tags: Miscellaneous

Definition:	Toxic to the ear, often resulting in damage
Pronunciation:	aw-toh-TOK-sis-uh-tee

Prefix	Root	Suffix
ot/o: ear	toxic/o: poison	-ity: state of

Clinical Pearls:

- Ototoxicity is associated with medication-related adverse events and can lead to hearing loss or complications if not appropriately monitored and evaluated.
- If ototoxicity is suspected, patients should undergo audiometric tests to adequately evaluate the impact of therapy.
- Otoxicity is associated with aminoglycoside antibiotics such as amikacin. Patients on platinum-based chemotherapy agents such as cisplatin and carboplatin are at increased risk. It is also a rare but serious side effect of medications include furosemide, metronidazole, and some NSAIDs including naproxen.

PALPITATIONS

Tags: Cardiology

Definition:	Irregular heartbeat
Pronunciation:	pal-puh-TAY-shuns

Prefix	Root	Suffix
	palpit/o: flutter, throbbing	-ation: process, condition

Clinical Pearls:

- Palpitations conditions related to the heart include arrhythmias or other cardiovascular issues.
- Patients who experience heart palpitations should receive an electrocardiogram (ECG) to evaluate the exact cause including a full past medical history to evaluate disease or medication related causes.
- Medication causes include caffeine (especially as a supplement OTC), vasodilators (clonidine), and stimulants such as dexmethylphenidate, modafinil, and phentermine among others.

PANCREATITIS

Tags: Gastrointestinal

Definition:	Inflammation of the pancreas
Pronunciation:	pan-KREE-uh-tye-tis

Prefix	Root	Suffix
	pancreat/o: pancreas	-itis: inflammation

Clinical Pearls:

- Pancreatitis is a potentially deadly disorder that causes inflammation of the pancreas. Pancreatitis can be acute or chronic; acute pancreatitis can be caused by gallstones, medications such as glucagon-like peptide-1 agonists, dipeptidyl peptidase-4 (DPP-4) inhibitors, valproic acid, and azathioprine, or significantly elevated triglycerides. Chronic pancreatitis is often the result of heavy alcohol use, genetics, or a blocked bile duct.
- Acute pancreatitis presents with nausea, vomiting, fever, and an intense pain in the upper abdomen. Chronic pancreatitis has a similar presentation but is less acute in nature and it can worsen with eating or drinking. Other signs and symptoms include chronic pain, steatorrhea, and diabetes are consistent with chronic pancreatitis.
- Pancreatitis is generally treated supportively but patients should be assessed for medication-related causes. There are a lot of medications that can cause pancreatitis in rare situations, but patients should receive appropriate nutritional support and cessation of alcohol. Patients with chronic pancreatitis may need pancrelipase enzymes with meals to treat malabsorption.

PANCYTOPENIA

Tags: Immunology

Definition:	Reduction of all cells in the blood
Pronunciation:	pan-sigh-TOH-pee-nee-uh

Prefix	Root	Suffix
pan-: all	cyt/o: cell	-penia: deficiency

Clinical Pearls:

- Pancytopenia is a clinical presentation of deficiencies of all types of blood cells that includes anemia, leukopenia, and thrombocytopenia.
- Immunosuppressive therapies for chronic diseases including methotrexate and adalimumab can cause pancytopenia. Other medication-related causes include antipsychotics such as aripiprazole and risperidone as well as anticonvulsants including carbamazepine, phenytoin, and levetiracetam.

PARALYSIS

Tags: Musculoskeletal

Definition:	Loss of voluntary movement
Pronunciation:	puh-RAL-uh-sis

Prefix	Root	Suffix
	para-: near, beside	-lysis: loosening, separation, destruction, breakdown

Clinical Pearls:

- Paralysis is a loss of voluntary movement and can be generalized and/or partial. The causes can be multifactorial and include brain injury, stroke, multiple sclerosis, and muscular dystrophy among other causes.
- Paralysis may be needed when using a paralytic to minimize discomfort during intubation in the intensive care unit (ICU).
- It is not often cited as an adverse reaction to medications; however, it can be a rare but serious side effect of tedizolid (facial) and polymyxin B.

PARALYTIC

Tags: Musculoskeletal, Neurology

Definition: Affected with paralysis

Pronunciation: pehr-uh-LIH-tick

Prefix	Root	Suffix
	para-: near, beside	-lytic: reduce, breakdown

Clinical Pearls:

- Medications that cause neuromuscular blockade are often referred to as paralytics. These medications help patients with significant agitation or pain in the Intensive Care Unit (ICU) as well as for endotracheal intubation, mechanical ventilation, and surgical relaxation. Examples include neuromuscular blockers such as cisatracurium, succinylcholine, and vercuronium.
- Each of these medications should be closely monitored by the degree of muscle paralysis along with vital signs when administration. Patients typically receive a sedative prior to and throughout paralysis caused by these agents.

PARESTHESIA

Tags: Neurological Disorder

Definition: Abnormal sensation

Pronunciation: pehr-us-THEE-juh

Prefix	Root	Suffix
par-: abnormal	-esthesia: nervous sensation	

Clinical Pearls:

- Paresthesia is a common sensation that produces a numbing, burning or prickling sensation that can occur anywhere in the body. It has been referred to the feeling of "pin and needles." Most cases of paresthesia are transient, but it can be a chronic condition of nerve damage or the result of a stroke, a neurological disease, multiple sclerosis, or damage to the central nervous system such as a tumor on the brain or spinal cord.
- Treatment involving controlling the underlying cause is a disease process but there is not one consistent approach to treatment.
- Paresthesia can be a medication-related adverse reaction. Examples include lidocaine patches, acetazolamide, cyclosporine, foscarnet, topiamate as well as many antineoplastic medications such as nelarabine.

PERICARDITIS

Tags: Cardiology

Definition: General inflammation of the sac surrounding the heart (pericardium)

Pronunciation: pehr-ee-car-DYE-tis

Prefix	Root	Suffix
peri-: surrounding	cardi/o: heart	-itis: inflammation

Clinical Pearls:

- The pericardium is a protective membrane sac that surrounds the heart—pericarditis occurs when the pericardium is inflamed. This commonly presents as swelling, chest pain, palpitations, and difficulty breathing—making it difficult to diagnose from other cardiac conditions on symptoms alone.
- Pericarditis can be caused by a viral infection, tuberculosis, as well as a chronic disease—rheumatoid arthritis, renal failure, and systemic lupus erythematous (SLE).
- Pericarditis is a rare but serious side effect of chemotherapeutics including cytarabine and patients with pericarditis should not take warfarin. Treatment includes therapies for inflammation including aspirin and nonsteroidal anti-inflammatory drugs (NSAIDs) plus colchicine and corticosteroids to relieve inflammation.

PETECHIAE

Tags: Dermatology

Definition: Inflammation of the membrane, often as the result of bleeding, that manifests in small round spots in the skin

Pronunciation: puh-TEE-kee-uh

Prefix	Root	Suffix
	petecchia (in plural) – Latin root word	

Clinical Pearls:

- Petechiae are small spots on the skin that occur as a result of bleeding. While the patterns look like a rash, it is usually a sign of another underlying cause. It can be caused by vasculitis, infections, leukemias, and thrombocytopenia.
- Medications that can cause petechiae include many medications that can cause bleeding. Some examples include nelarabine, azacytidine, duloxetine, and phenytoin.

PHARYNGITIS

Tags: Infectious Disease

Definition: Inflammation of the pharynx

Pronunciation: feh-rin-JAI-tis

Prefix	Root	Suffix
	pharyng/o: throat (pharynx)	-itis: inflammation

Clinical Pearls:

- Pharyngitis is a very common outpatient diagnosis each year and can affect both children and adults but is more common in children. It can be caused by either viruses or bacteria, the most common of which is group A beta-hemolytic streptococcal (GABHS).
- *Streptococcal* pharyngitis is commonly known as “strep” or “strep throat”; it commonly presents with acute sore throat, redness, pain swallowing, fever, and inflammation of the tonsil/pharynx.
- GABHS pharyngitis is diagnosed commonly using a rapid antigen detection test (RADT) where the sample is collected as a throat swab.
- Positive results should be treated with an appropriate antibiotics including amoxicillin or penicillin V, or cephalexin or azithromycin if the patient has a penicillin allergy.
- Do not give children aspirin due to the association with Reye syndrome.
- For symptomatic relief consider throat lozengers or rinsing/gargling with a warm salt mixture three to four times a day.

PHLEBITIS

Tags: Miscellaneous

Definition: Inflammation of a vein

Pronunciation: fluh-BYE-tis

Prefix	Root	Suffix
	phleb/o: vein	-itis: inflammation

Clinical Pearls:

- Phlebitis is a common medication-related adverse event that occurs when medications are infused intravenously. When it is caused by a blood clot, it is referred to as thrombophlebitis.
- Signs and symptoms are tenderness on palpation, redness, swelling, and erythema of the skin over the vessel. The risk of phlebitis should be accounted for when delivering parenteral nutrition as well as many medications when infused. Medications including acyclovir, bleomycin, cefepime, sodium chloride, and nicardipine are examples among others. Often filters and extended infusion times are used to minimize the risk.
- Some infused formulations add heparin and hydrocortisone to reduce risk of phlebitis and thrombophlebitis. Superficial thrombophlebitis can be treated with blood-thinning medications.

PHOTOPHOBIA

Tags: Dermatology

Definition:	Very painful response or intolerance to strong light
Pronunciation:	foh-toh-FOH-bee-uh

Prefix	Root	Suffix
	phot/o: light	-phobia: fear

Clinical Pearls:

- Photophobia is an enhanced response/sensitivity to light that occurs as lights are brighter that causes discomfort or pain. This is a common symptom of patients who suffer from migraine headaches and if seriously enough, can cause disability. The exact cause is unknown, but it can be worsened by dry eye disease (DED). Medications that have the potential to cause photophobia include ophthalmic corticosteroids such as loteprednol as well as ophthalmic prostaglandin analogues such as bimatoprost.
- Patients should be counseled on appropriate administration technique and to avoid bright lights right after administration by keeping the eyes shut for 1-2 minutes after administration, especially with the ointment formulation.
- Patients should avoid bright, flickering lights and protect their eyes from sunlight
- Diclofenac has been used to reduce the ocular pain and photophobia seen in patients that have undergone corneal refractory surgery.

PHOTOSENSITVITY

Tags: Dermatology

Definition: An adverse reaction to sunlight

Pronunciation: foh-toh-sen-suh-TIV-uh-tee

Prefix	Root	Suffix
phot/o: light	sent: feel, sense	-ity: state of

Clinical Pearls:

- A variety of medications can cause photosensitivity, primarily driven by two mechanisms: toxicity or allergenicity. Toxic reactions occur based on the absorption of UV light presents as a traditional sunburn and/or rash. Allergic reactions are the result of light altering the medication resulting in a cutaneous reaction where the skin produced an immune response in response to UV light and often a topical medication or cosmetic product.
- Photosensitivity is an important concern when treating acne vulgaris—most medications used to treat acne can cause photosensitivity. Other chronic diseases such as systemic lupus erythematosus (SLE) with cutaneous manifestations put patient at a higher risk to develop a photosensitive rash.
- Medications that cause photosensitivity include antibiotics including tetracyclines (doxycycline, tetracycline), fluoroquinolones (levofloxacin, ciprofloxacin), and sulfonamides (trimethoprim/sulfamethoxazole). Other medications include amiodarone, methotrexate, and promethazine, hydroxychloroquine among others.

POLYDIPSIA

Tags: Endocrinology

Definition:	Excessive thirst
Pronunciation:	paw-lee-DIP-see-uh

Prefix	Root	Suffix
poly-: many, much	dips/o: thirst (Latin)	-ia: condition

Clinical Pearls:

- Polydipsia is present at the diagnosis of type 1 Diabetes Mellitus (DM) and uncontrolled type 2 DM as one of the body's metabolic responses to diabetes.
- Chronic use of lithium may produce polydipsia in patients with nephrogenic diabetes insipidus.
- Polydipsia can cause euvolemic hyponatremia as a result of primary psychogenic polydipsia.

POLYPHAGIA

Tags: Endocrinology, Gastrointestinal

Definition:	Excessive eating and increased appetite
Pronunciation:	paw-lee-FAY-jee-uh

Prefix	Root	Suffix
poly-: many, much	phag/o: eat, swallow	-ia: condition

Clinical Pearls:

- Polyphagia can be associated with obesity and responsible for a variety of associated metabolic disorders.
- Often associated with a diagnosis of type 1 Diabetes Mellitus (DM), a presentation of symptoms including polyphagia (along with polyuria and polydipsia), are typically present at initial diagnosis due to a lack of necessary insulin production. While patients with type 1 DM do not typically present as obese, polyphagia is a natural response to associated weight and caloric loss.
- Often associated with hyperthyroidism and endocrine diseases such as Graves disease.
- It has also been noted in Prader-Willi syndrome and other genetic conditions caused by chromosomal anomalies.

POLYURIA

Tags: Genitourinary

Definition:	Increased frequency of urine
Pronunciation:	paw-lee-YUR-ee-uh

Prefix	Root	Suffix
poly-: many, much	ur/o: urine	-ia: condition

Clinical Pearls:

- Commonly found on the diagnosis of diabetes mellitus, hyperglycemia is a significant cause of polyuria as the body tries to maintain glucose homeostasis in the absence of adequate insulin supply.
- Polyuria is the most common side effect of diuretics as the mechanism of each agent is designed to produce diuresis.
- Polyuria and polydipsia can be a sign of drug-induced nephrotoxicity for patients on lithium. Polyuria is an expected adverse event for patients taking tolvaptan to treat hyponatremia as a vasopressin antagonist.
- Lithium is contraindicated in patients with polyuria.

POSTMENOPAUSAL

Tags: Women's Health

Definition:	After the conclusion of menstruation, called menopause
Pronunciation:	post-men-oh-PAW-zuhl

Prefix	Root	Suffix
post-: after, behind	men/o: menses, menstruation	-al: pertaining to

Clinical Pearls:

- Menopause occurs as a natural process of aging in women which is defined by the final menstrual period that typically occurs between 45 and 55. Postmenopausal is the period of time 1 year after the menopause to the conclusion of life.
- Menopause (and subsequent postmenopausal period) can also occur as the result of an oophorectomy and/or radiation and chemotherapy treatment that affects ovarian cancer.
- Hot flashes and night sweats are common symptoms and can occur in the period prior to menopause and can extend to the postmenopausal period. The resulting loss of estrogen can have significant effects on everything from body weight to bone health and skin changes. Laboratory tests include elevated follicle-stimulating hormone (FSH) of > 30 mIU/mL in postmenopausal women.
- Patients with severe symptoms may treat with estrogen that can be delivered orally, transdermal, or vaginally. Other options include non-hormonal options such as SNRI's and SSRIs as well as vaginal moisturizers for localized dryness.
- Osteoporosis in postmenopausal women is common.

PREECLAMPSIA

Tags: Women's health

Definition: Serious condition towards the end of pregnancy that may progress to eclampsia

Pronunciation: pre-uh-KLAMP-see-uh

Prefix	Root	Suffix
pre-: before	Greek origin (eklampis): sudden development	-ia: condition

Clinical Pearls:

- Preeclampsia is a hypertensive disorder that developed during pregnancy that can result in complications for both the mother and child. It may present as abdominal pain, nausea, vomiting, and confusion.
- It usually occurs during the second half of pregnancy (after 20 weeks).
- It is diagnosed by elevated blood pressure along with proteinuria, thrombocytopenia, elevated serum creatinine, elevated liver function tests, and/or visual symptoms. Risk factors include chronic hypertension, diabetes, kidney disease or previous preeclampsia.
- Some of the signs and symptoms include change in vision, headache, and stomach ache.
- Treatment includes managing the hypertension with labetalol, nifedipine, or methyldopa and some patients at high risk will be treated with low dose aspirin during gestation from weeks 12 to 28. Preeclampsia is only fully treated by delivery and symptoms can continue for a few weeks postpartum.

PREMENSTRUAL

Tags: Women's Health

Definition:	Occurring prior to menstruation
Pronunciation:	pre-MEN-struhl

Prefix	Root	Suffix
pre-: before	men/o: menses, menstruation	al: pertaining to

Clinical Pearls:

- Premenstrual refers to the last 5-7 days prior to menses. Patients who are diagnosed with premenstrual syndrome (PMS) experience somatic (breast tenderness, abdominal bloating, swelling) or psychiatric symptoms (anxiety, irritability, outbursts) for at least 3 consecutive months. Severe PMS is premenstrual dysphoric disorder (PMDD) where the patient experience multiple symptoms and they are directly attributable to the menstrual cycle.
- Treatments for PMDD include SSRIs such as fluoxetine, paroxetine, and sertraline. Alternatives include SNRI's such as venlafaxine and combination hormonal contraceptives.
- Patients with PMS can benefit from lifestyle changes include restricting sodium, sugar, and caffeine and avoiding large meals if bloating occurs. While exercise won't affect acute symptoms, general wellness efforts may improve the response to the treatments described above.

PRIAPISM

Tags: Genitourinary

Definition: A prolonged, painful erection

Pronunciation: PRY-uh-piz-um

Prefix	Root	Suffix
	Latin origin (priapismus)	

Clinical Pearls:

- Priapism is a disorder that can be painful and is defined as a sustained erection that lasts longer than 4 hours.
- It is not related to sexual stimulation or having sex.
- Priapism can be the result of hematological conditions including leukemia and sickle cell anemia. Conditions and medication that affect blood flow can potentially cause priapism.
- Medications that can cause priapism are known side effects of medications used to treat erectile dysfunction such a sildenafil, tadalafil, and vardenafil. Other medications include antidepressants such as bupropion and trazodone and antipsychotics such as risperidone as well as other medications including terazosin and warfarin.

PROARRHYTHMIC

Tags: Cardiology

Definition: A medication that can cause an arrhythmia, or have properties to cause an arrhythmia

Pronunciation: pro-uh-RYTH-mik

Prefix	Root	Suffix
pro-: before, forward	rhythm/o: regular repeated pattern	-ic: pertaining to
a-: no, not, without		

Clinical Pearls:

- Medications that can have proarrhythmic effects are referred to as antiarrhythmic drugs (AAD). These medications on the whole affect conduction of the heart and are organized by class (Ia, Ib, Ic, II, III, III, IV) based on the ion block, conduction, and refractory period.
- Most of these AADs have potential proarrhythmic toxicity. Examples of these medications that can have proarrhythmic toxicities include amiodarone (III), disopyramide (Ia), and lidocaine (Ib) among many others in this category.
- The herb gingko biloba has been associated with arrhythmias.

PROCTITIS

Tags: Gastrointestinal

Definition:	Inflammation of the anus and rectum
Pronunciation:	prok-TYE-tis

Prefix	Root	Suffix
	proct/o: anus and rectum	-itis: inflammation

Clinical Pearls:

- Proctitis can occur as a result of inflammatory bowel disease and is often associated with ulcerative colitis (UC), but in ulcerative proctitis, the inflammation is limited to the rectum or Crohn's disease.
- Signs and symptoms of proctitis include rectal pain, bleeding, and increased urgency.
- Proctitis can be treated with mesalamine but should be delivered as a suppository. Other treatments for UC may be considered including systemic corticosteroids to reduce inflammation.
- Proctitis is a rare but serious side effect of pentosan used to treat pain from interstitial nephritis along with rectal hemorrhage.
- Dietary changes including foods high in fiber, whole grains, fresh fruits and vegetables have proven to be beneficial.

PROPHYLAXIS

Tags: Miscellaneous

Definition:	Prevention
Pronunciation:	pro-fuh-LAK-sis

Prefix	Root	Suffix
	pro-: before, forward	-phylaxis: protection

Clinical Pearls:

- Prophylaxis has a wide and large variety in the practice of medicine. Prophylaxis is used to prevent infection, to reduce the risk of hypersensitivity, osteoporosis, anti-inflammatory precautions, cardiovascular disease, migraines, and in cases of anticipated chemotherapy-induced nausea/vomiting (CINV).
- In addition to an entire host of antibacterial, antiviral, antihistamine, and anti-inflammatory medications, the role of vaccinations in medicine is like a prophylactic protection against infectious disease.

PROSTATITIS

Tags: Genitourinary

Definition:	Inflammation of the prostate gland
Pronunciation:	pros-tuh-TYE-tis

Prefix	Root	Suffix
	prostat/o: prostate gland	-itis: inflammation

Clinical Pearls:

- Prostatitis is general inflammation of the prostate and often diagnosed as the result of an infection. Bacterial prostatitis can be acute or chronic. Symptoms for acute prostatitis include fever, dysuria, myalgia, and chronic prostatitis symptoms include difficulties in frequency and urgency and back pain.
- Bacterial prostatitis is treated by a fluoroquinolone antibiotic such as ciprofloxacin or levofloxacin. Duration for therapy should be at least 4 weeks to prevent or treat chronic prostatitis. Alternative options include cephalosporins or trimethoprim-sulfamethoxazole followed by surgery if ineffective. Cephalosporins have also been used.

PRURITUS

Tags: Dermatology

Definition:	Itching, most commonly of the skin
Pronunciation:	proo-RAI-tus

Prefix	Root	Suffix
	prurit/o: itching	-us: structure

Clinical Pearls:

- Pruritus is itching of the skin and a significant feature of a many dermatological conditions. Pruritis can be acute or chronic as well as localized or generalized.
- Effective treatment does not have to necessarily include medications. Non-pharmacological options include moisturizers, hydration, using hypoallergenic cleansers, and occlusive bandages if needed.
- Pharmacologic options include systemic oral antihistamines to reduce itching such as diphenhydramine and chlorpheniramine and in some cases corticosteroids. Topical antihistamines are not as effective. Serious, chronic pruritis can be treated with topical tacrolimus if inflammation is present.

PSORIASIS

Tags: Dermatology, Immunology

Definition: Abnormal condition of the skin marked by redness and itching

Pronunciation: suh-RYE-uh-sis

Prefix	Root	Suffix
	psor/o: itching	-iasis: abnormal condition

Clinical Pearls:

- Psoriasis is a chronic, inflammatory disease involving the immune system that causes inflammation of the skin cells. Its exact cause is still unknown but genetics, infection, and immunologic factors all appear to play a role.
- Psoriasis is classified based on type (plaque, guttate, pustular, inverse, nail) and external involvement (which when joint pain is involved) is referred to as psoriatic arthritis. Psoriasis is also considered mild, moderate, and severe based on the amount of body surface area (BSA) affected by psoriasis.
- Treatment includes topical therapies such as clobetasol and fluocinonide, oral therapies including methotrexate and apremilast, and biologic therapies including infliximab, ixekizumab, and ustekinumab among others.
- Patients with psoriasis should be encouraged to practice skin care including moisturizers to reduce pruritus.
- Smoking cessation was shown to improve outcomes in psoriasis.
- Ultraviolet ray exposure, natural or light therapy, has been shown to beneficial.

PSYCHOSIS

Tags: Neurology

Definition: Abnormal condition of the mind

Pronunciation: sigh-KOH-sis

Prefix	Root	Suffix
	psych/o: mind	-osis: condition, abnormal state

Clinical Pearls:

- Psychosis refers to a group of conditions and illnesses that affect the mind. Examples include, but are not limited to, schizophrenia, mood disorders such as depression and bipolar disorder, or can be substance-induced.
- Some signs and symptoms may include delusions, hallucinations, a state of confusion.
- Second generation antipsychotics such as aripiprazole can increase the risk of stroke or death in elderly patients with dementia-related psychosis.
- Other medications that can cause drug-induced psychosis include benztropine, efavirenz, and dexmethylphenidate among others.
- The use of alcohol has been known to induce this disorder.

PYELONEPHRITIS

Tags: Genitourinary, Infectious Disease

Definition: Inflammation of the kidney and pelvic area secondary to infection

Pronunciation: pie-uh-loh-neh-FRY-tis

Prefix	Root	Suffix
pyel/o: renal, pelvis	nephr/o: kidney	-itis: inflammation

Clinical Pearls:

- Pyelonephritis is considered a complicated urinary tract infection (UTI). While UTI's are more common in females than males; UTIs in males often present as complicated UTI.
- Patients with pyelonephritis can present with more advanced symptoms include nausea, vomiting, chills, and high-grade fever will require more significant treatment. Patients should undergo urinalysis and culture to ensure appropriate antibiotic selection. Many of these agents will need parenteral therapy. Patients who require catheterization are at higher risk for pyelonephritis.
- Patients treated in the outpatient setting will have longer duration of antibiotic therapy such as fluoroquinolones (levofloxacin) will be used for at least 7 days and up to 14 days for other antibiotics.

PYREXIA

Tags: Immunology

Definition: Elevation of temperature; fever

Pronunciation: pie-REX-ee-uh

Prefix	Root	Suffix
	pyrex: fever	-ia: condition

Clinical Pearls:

- Pyrexia (fever) is a common medication-related adverse event for patients who are being treated for cancer-related disorders with chemotherapy.
- Examples of medications that are known to cause pyrexia include eribulin, gemcitabine, and ogatumumab among others.
- When a medication is known to cause pyrexia, it is common to premedicate with acetaminophen 30-60 minutes prior to infusions to reduce the risk for pyrexia.

RETINITIS

Tags: Ocular

Definition:	Inflammation of the retina
Pronunciation:	reh-tin-AY-tis

Prefix	Root	Suffix
	retin/o: retina	-itis: inflammation

Clinical Pearls:

- Retinitis is from a class of retinal diseases and is commonly associated with infection.
- Treatment for cytomegalovirus retinitis in patients with acquired immunodeficiency syndrome includes foscarnet and ganciclovir.
- A form of retinitis, retinitis pigmentosa, is a genetic condition that can lead to vision loss and night blindness.

RETINOPATHY

Tags: Optical

Definition:	Non-inflammatory disease of the retina
Pronunciation:	reh-tin-AW-puh-thee

Prefix	Root	Suffix
	retin/o: retina	-pathy: disease

Clinical Pearls:

- Retinopathy can develop as a result of complications of disease, the most common of which is Diabetes Mellitus, referred do a diabetic retinopathy. Effective glucose and blood pressure control is crucial in reversing initial retinopathy while more advanced disease does not improve with additional glycemic control.
- Retinopathy is caused by damage to the blood vessels of the retina, light sensitive tissue at the back of the eye.
- There are classes of medications that are commonly associated with drug-induced retinopathies: Aminoquinolines (chloroquine and hydroxychloroquine), anti-estrogen agents (tamoxifen), phenothiazines (chlorpromazine), and retinoids (isotretinoin).

REVASCULARIZATION

Tags: Cardiology

Definition:	Restoring blood flow to an area or organ of the body
Pronunciation:	ree-vas-cue-lar-ih-ZAY-shun

Prefix	Root	Suffix
re-: back; backward	vascul/o: vessel (blood)	-ization: process, condition

Clinical Pearls:

- Revascularization, typically done by surgery, is an important non-pharmacologic therapy for the treatment of stable ischemic heart disease (SIHD). Examples include coronary artery bypass grafting (CABG) or percutaneous coronary intervention (PCI) with or without stents.
- Pharmacotherapy including antithrombotic therapy is used after PCI to reduce the risk for thrombosis. Patients are usually prescribed dual antiplatelet therapy including aspirin and a P2Y12 inhibitor such as clopidogrel.

RHABDOMYOLYSIS

Tags: Musculoskeletal

Definition: A condition that causes the breakdown of muscle tissue where breakdown products enter systemic circulation causing acute injury

Pronunciation: rab-doh-my-uh-LYE-sis

Prefix	Root	Suffix
	rhabdomy/o: striated skeletal muscle	-lysis: breakdown, separation, destruction, loosening

Clinical Pearls:

- Rhabdomyolysis can be drug-induced and is a known cause of acute kidney injury. It can also occur from vigorous exercises, infection, and diabetic ketoacidosis.
- Rhabdomyolysis is most commonly associated with a rare but serious side effect of statin medications including lovastatin, pravastatin, and rosuvastatin but are associated with many other medications including colchicine and proton pump inhibitors such as lansoprazole.
- Symptoms of rhabdomyolysis include myalgias, arthralgias, fatigue, and darkening of the urine in kidney injury.
- While laboratory values aren't typically assessed for myalgia, patients with a creatine kinase (CK) elevation 10 times over baseline and elevated serum creatine (SCr) may be a sign of acute kidney injury.
- Medication including gemfibrozil should not be administered with statin medications due to the risk of rhabdomyolysis. Concurrent antihyperlipidemia therapy administered with statin medications such as niacin and ezetimibe.

RHEUMATIC

Tags: Immunology, Musculoskeletal

Definition: Often refers to a group of diseases or conditions that affect the joints and are marked by swelling and pain

Pronunciation: roo-MAH-tik

Prefix	Root	Suffix
	rheumat/o: watery flow	-ic: pertaining to

Clinical Pearls:

- Larger term that encompasses disease of the joints including rheumatoid arthritis and gout, among others.
- Often refers to complications that occur as the result of rheumatic fever, including endocarditis.

RHINITIS

Tags: Miscellaneous

Definition:	Inflammation of the mucus membrane of the nose
Pronunciation:	rye-NYE-tis

Prefix	Root	Suffix
	rhin/o: nose	-itis: inflammation

Clinical Pearls:

- While rhinitis can be a symptom of a variety of inflammatory process, it is most commonly associated with allergic rhinitis, swelling of the mucous membrane in the nose.
- If untreated, rhinitis can cause fatigue, loss of sleep, and chronic malaise.
- Treatment for allergic rhinitis is typically safe and well-tolerated including over-the-counter products such as antihistamines like loratadine, fexofenadine, and chlorpheniramine as well as nasal sprays such as fluticasone and triamcinolone.

RHINORRHEA

Tags: Miscellaneous

Definition: Excessive mucus flow from the nose. Also known as a "runny nose."

Pronunciation: rye-noh-REE-uh

Prefix	Root	Suffix
	rhin/o: nose	-rrhea: flow, discharge

Clinical Pearls:

- Rhinorrhea is one of the most common symptoms of allergic rhinitis.
- As a symptom, treatment of rhinorrhea is similar to allergic rhinitis with a focus on reducing mucus flow. Examples include cromolyn as well as nasal sprays such as fluticasone and triamcinolone.

SEPTICEMIA

Tags: Infectious Disease

Definition: Presence of bacteria into the blood stream that can cause systemic illness

Pronunciation: sep-tuh-SEE-mee-uh

Prefix	Root	Suffix
	sepsis: putrefy, decay, rot	ic: pertaining to, -emia: blood, condition of blood

Clinical Pearls:

- Sepsis is a life-threatening illness that occurs as a response to an infection and can cause end organ damage as a result of the inflammatory response. Septicemia is the presence in the blood stream that can affect multiple organ systems. It can occur in almost any part of the body but is most likely associated with infections in the bowels, kidneys, lungs or the skin.
- Sepsis is noted for hypotension, hypovolemia, and hypotension (in addition to initial infection signs/symptoms) that lead to heart/brain failure, circulation issues, and kidney failure. Septic shock is patients whose hypotension is not responding to fluids.
- Patients with sepsis and septicemia need to be treated with fluids, corticosteroids (hydrocortisone), vasopressors (vasopressin), broad-spectrum antibiotics, insulin, and heparin.

SINUSITIS

Tags: Infectious Disease

Definition:	Swelling or inflammation of sinus tissue
Pronunciation:	sigh-nuh-SIGH-tus

Prefix	Root	Suffix
	sinus/o: sinus	-itis: inflammation

Clinical Pearls:

- Sinusitis is diagnosed by the assessment of major and minor symptoms. If two major symptoms (purulent anterior or posterior nasal discharge, nasal congestion or obstruction, facial congestion or pain/pressure, or anosmia) or one major combined with two minor symptoms (headache, ear pain, pressure, or fullness, halitosis, tooth pain, cough, fever, and fatigue) to meet the diagnostic criteria for sinusitis.
- Sinusitis can last up to 4 weeks (acute) or more than 12 weeks (chronic). Sinusitis can be treated with antihistamines.
- When acute bacterial sinusitis occurs in the nose, it is referred to as rhinosinusitis (prefix: Rhin/o: nose) and is commonly treated with amoxicillin/clavulanate. Diagnostic criteria for acute bacterial rhinosinusitis include persistent symptoms (> 10 days), fever and rhinorrhea, or new onset of symptoms following upper respiratory infection after initial improvement.

SOMNOLENCE

Tags: Miscellaneous

Definition: A state of drowsiness or sleepiness

Pronunciation: SOM-nuh-lence

Prefix	Root	Suffix
	somn/o: sleep	-ence: state or condition

Clinical Pearls:

- Somnolence is a condition of drowsiness that is also sometime referred to as excessive daytime sleepiness (EDS). While somnolence is a common medication-related adverse event, it may be caused by an underlying condition such as obstructive sleep apnea (OSA).
- Medications indicated for the treatment of EDS with or without OSA include modafinil, armodafinil, among others and patients will sometime be treated with stimulants taken upon waking.
- Medications that cause somnolence are plentiful. Examples include all medications indicated for insomnia (zolpidem, etc.), benzodiazepines (diazepam), and first-generation antihistamines (diphenhydramine), which is indicated for treatment of short-term insomnia over-the-counter (OTC).

SPASTICITY

Tags: Musculoskeletal

Definition:	State of hypertonic muscles including spasm
Pronunciation:	spa-STIH-suh-tee

Prefix	Root	Suffix
	-spastic: spasm	-ity: state of

Clinical Pearls:

- Spasticity can refer to a spasm defined by any anatomical descriptor, but is clinically associated with either muscle spasticity (ie, back spasms) or spasticity associated with muscles in the bladder. Tetanus is notable in rare cases of causing spastic muscles spasms that may cause significant rigidity in the back, chest, and neck muscles.
- Treatment for general muscle spasticity includes skeletal muscle relaxants including baclofen, tizanidine, and cyclobenzaprine. Clonidine has been used for bladder spasticity and implantable baclofen has been used intrathecally to help resolve signs of urinary frequency and urgency associated with balder spasticity. Injectable forms of methocarbamol are used for spasticity associated with tetanus.
- Treatment for chronic spasticity (ie, multiple sclerosis, cerebral palsy, spinal cord injury) include dantrolene.

SPLENOMEGALY

Tags: Immunology

Definition:	Enlargement of the spleen
Pronunciation:	spleh-noh-MEG-uh-lee

Prefix	Root	Suffix
	splen/o: spleen	-megaly: enlargement

Clinical Pearls:

- The spleen is responsible for immune cell regulation by filtering old immune cells from the blood and provides a location where the blood can interact with necessary immunologic cells. Splenomegaly is an enlargement of the spleen that is the result of inflammatory processes that involve leucocytes, erythrocytes, and platelets.
- Splenomegaly presents as pain in the left upper quadrant of the abdomen. Splenomegaly is often associated with an underlying illness, such as leukemias, cirrhosis, and rheumatoid arthritis (along with neutropenia is called Felty's syndrome) among other immune-related disorders. Management of the splenomegaly usually includes treatment of the underlying illness.

STOMATITIS

Tags: Miscellaneous

Definition:	Inflammation of the mouth
Pronunciation:	stoh-muh-TYE-tis

Prefix	Root	Suffix
	stomat/o: mouth	-itis: inflammation

Clinical Pearls:

- Stomatitis is a general term for inflammation of the mouth. It can be related to a variety of causes including infection, denture use, and chemical irritants (including medications).
- Stomatitis is a serious medication-related adverse reaction of many antineoplastic and immunosuppressive medications including bleomycin, cytarabine, and everolimus among others. It is very commonly associated with methotrexate (MTX), which is first line therapy for rheumatoid arthritis (RA), psoriasis and various cancers. Patients who take MTX weekly for RA should co-administer folic acid 1 mg by mouth once daily (except for the day with MTX, or 12 hours apart) to reduce the risk of stomatitis.
- Patients at risk for stomatitis should follow good oral hygiene practices. When unable to discontinue the causative agent, an antifungal treatment may be appropriate based on patient-specific factors.

SYNCOPE

Tags: Neurology

Definition: Loss of consciousness as a result of lack of blood flow to the brain

Pronunciation: SYN-co-pe

Prefix	Root	Suffix
	non-constructed medical term	

Clinical Pearls:

- Syncope is a rapid loss of consciousness often followed by quick recovery that can be related to a lack of blood flow to the brain and can be as the result of cardiovascular abnormalities. Syncope can also be situational, such as when a patient receives an immunization. Patients who experience syncope should undergo a full cardiovascular workup to determine the potential presence of arrhythmias.
- Vasovagal syncope is more common in younger adults than older adults. This occurs as a response to a trigger that may cause a reflex reaction in certain patients potentially caused by pain, heat, or sight of a blood or needle.
- Syncope can be caused by orthostatic hypotension and caution should be used to eliminate risk when patients are moved from lying down or sitting to an upright position.
- Pharmacists should work with patients to identify any medication-related causes and assess other causes including hypoglycemia and seizures among others.

STEATORRHEA

Tags: Gastrointestinal

Definition:	Excess fat in stools
Pronunciation:	stee-uh-REE-uh

Prefix	Root	Suffix
	steat/o: fat, sebum	-rrhea: flow, discharge

Clinical Pearls:

- Steatorrhea may be a sign of chronic liver or pancreatic disease as evidence of malabsorption.
- Patients with steatorrhea and chronic pancreatitis may need pancrelipase enzymes with meals to treat malabsorption. Patients often benefit from the addition of a proton pump inhibitor (omeprazole) or histamine-2 receptor antagonist (famotidine) to increase efficacy. Patients should be counseled to eat smaller meals and reduce fat intake as much as possible.
- Steatorrhea is an expected medication-related adverse event of orlistat, a lipase inhibitor, indicated for weight loss available in both prescription and over-the-counter dosages. Patients who do not reduce fat in their meals with concurrent administration will experience steatorrhea.

SYSTEMIC LUPUS ERYTHEMATOSUS

Tags: Immunology

Definition:	Most common form of lupus
Pronunciation:	er-uh-thee-muh-TOE-sis

Prefix	Root	Suffix
	erythem/o: flushed, redness	-osis: condition, abnormal state

Clinical Pearls:

- Systemic lupus erythematosus (SLE), or more commonly referred to as Lupus, is the clinical diagnosis of the most common form of Lupus. Lupus is an autoimmune disorder that can affect nearly every organ in the body and responsible for significant inflammation and damage. Symptoms include pain, fatigue, arthrgias, and organ-specific symptoms. Other types of lupus exist are noted based on their specific organ focus, such as lupus nephritis (LN).
- Primary manifestations of SLE include cardiovascular, renal, and cutaneous manifestations among others. Diagnosis of SLE is complex and often requires multiple exclusionary diagnoses to confirm the patient has SLE. SLE involves multiple inflammatory markers as well as disease manifestations.
- The most common cutaneous manifestation is a malar rash, often referred to as a butterfly rash, that is, butterfly-shaped across the nose and cheeks.
- Medications that are used to treat include systemic corticosteroids (including prednisone) as well as potent immunosuppressants such as cyclophosphamide and mycophenolate mofetil.
- Drug-included Lupus (DIL) can be caused by medications; commonly cited medications include chlorpromazine, hydralazine, isoniazid, minocycline, methyldopa, and procainamide.

TACHYARRHYTHMIA

Tags: Cardiology

Definition:	Rapid heartbeat with arrhythmia
Pronunciation:	tak-ee-uh-RITH-mee-uh

Prefix	Root	Suffix
Tachy-: fast	rhythm/o: regular repeated pattern	-ic: pertaining to
a-: no, not, without		

Clinical Pearls:

- Tachyarrhythmia is a combination of an arrhythmia with tachycardia. Most patients will be treated with surgical ablation or an implantable cardioverter-defibrillators (ICD).
- Patients will undergo an electrocardiogram (ECG) to define the tachyarrhythmia and patients may experience syncope related to the tachyarrhythmia and cardiovascular health. Treatment is consistent with other arrhythmias; patients with atrial fibrillation and flutter will need to be monitored for appropriate thromboprophylaxis.
- Medication-related causes of tachyarrhythmia include stimulants such as phentermine. Other medications include hydralazine, bupropion, and levalbuterol among others.

TACHYCARDIA

Tags: Cardiology

Definition:	Rapid heartbeat
Pronunciation:	tak-ee-CAR-ee-uh

Prefix	Root	Suffix
tachy-: fast	cardi/o: heart	-ia: condition

Clinical Pearls:

- Tachycardia refers to a rapid heartbeat of any origin. Common examples include supraventricular tachycardia (SVT) or ventricular tachycardia (VT). SVT is an arrhythmia that causes tachycardia spontaneously. VT occurs in the ventricles and causes tachycardia that can increase risk for cardiac arrest.
- Tachycardia can develop in response to heart failure with reduced ejection fraction (HFrEF) where the heart develops a compensatory response to decreased cardiac output.
- Medications that can cause tachycardia include inhaled beta-agonists such as albuterol and stimulants including dexmethylphenidate.
- Depending on the cause of tachycardia, treatment with beta-blockers (metoprolol), calcium channel blockers (verapamil) and/or an ablation can be used to reduce heart rate.

TENDINITIS

Tags: Musculoskeletal

Definition: Inflammation of the tendon

Pronunciation: ten-duh-NIGH-tis

Prefix	Root	Suffix
	tendin/o: tendon	-itis: inflammation

Clinical Pearls:

- Tendinitis is inflammation associated with a tendon and is most commonly a sports injury. Tendinitis presents pain and swelling at the site of injury and often a dull pain.
- Tendinitis is often treated through rest and exercise and appropriate anti-inflammatory treatment with NSAIDs (ibuprofen and naproxen).
- Fluroquinolone antibiotics such as levofloxacin and ciprofloxacin have a black box warning because these antibiotics increase the risk of tendinitis and tendon rupture. This most often occurs in the Achilles tendon and are more likely to affect older adults and taking corticosteroids such as prednisone.

TERATOGENIC

Tags: Miscellaneous

Definition:	Causing malformation of a fetus
Pronunciation:	teh-rah-toh-GEN-ick

Prefix	Root	Suffix
	terat/o: malformed fetus	-genic: produced by or in

Clinical Pearls:

- Teratogenic refers to any substance (including medications) that cause damage to the fetus during the gestation period and result in congenital malformations.
- Medications contain warnings for teratogenicity based on known risks to the fetus. However, most teratogenic risks of medication are based on animal models due to the ethical risks of drug research. Case studies, animal models, and post-marketing research are crucial for understanding the impact of medication during pregnancy.
- The timing of medication use during the gestation period may impact the risk of teratogenicity. Examples of all teratogenic medications cannot be included here, but prominent examples include statin therapy (simvastatin, atorvastatin), ACE-inhibitors (lisinopril), chemotherapy (methotrexate, dacarbazine, and cyclophosphamide), some anticonvulsants (divalproex), lithium, warfarin, and thalidomide among others.

THROMBOCYTOPENIA

Tags: Hematology

Definition:	Decrease in number of platelets present in the blood
Pronunciation:	throm-boh-sigh-toh-PEE-nee-uh

Prefix	Root	Suffix
thromb/o: clot	-cyt/o: cell	-penia: deficiency

Clinical Pearls:

- Thrombocytopenia is typically clinical defined as less than 100,000 cells/mm^3 (100×10^9/L) platelets or a reduce of more than one-half of original platelet count.
- Drug-induced thrombocytopenia is most commonly caused by heparin, a term called heparin-induced thrombocytopenia (HIT). Patients with HIT are more likely to develop thromboembolic complications.
- HIT is commonly treated by discontinuation of heparin with anticoagulation medications including argatroban and bivalirudin among other thrombin inhibitors.
- There are nearly 100 medications that have been associated with thrombocytopenia including case reports, post marketing reports, and observational studies.

THROMBOEMBOLIC

Tags: Hematology, Cardiology

Definition: Blockage of a blood vessel by a thrombus, often referred to as a specific event

Pronunciation: throm-boh-em-BAW-lik

Prefix	Root	Suffix
thromb/o: clot	embolo/o: embolus	-ic: pertaining to

Clinical Pearls:

- The most common type of thromboembolic event is a venous thromboembolism (VTE) caused by a thrombus that circulates through the venous system. A deep vein thrombosis (DVT) and/or pulmonary embolism (PE) are manifestations of VTE that can be fatal if untreated.
- Patients at high-risk for VTE include older adults with risk increasing with age. Patients with a previous VTE, obesity, or diagnosed with a coagulation disorder are at higher risk.
- VTE is a medication-related adverse reaction of estrogen and other similar medications including estradiol and raloxifene. Use of these medications in combination with other risk factors, such as age and smoking tobacco, increases the risk for thromboembolic events.

THROMBOLYTIC

Tags: Hematology, Cardiology

Definition: Elimination or breakdown of a clot

Pronunciation: throm-boh-LIH-tik

Prefix	Root	Suffix
thromb/o: clot		-lytic: reduce, destroy separate, breakdown

Clinical Pearls:

- A thrombolytic medication, such as alteplase, binds to fibrin in a thrombosis to convert plasminogen to plasmin.
- Most patients with venous thromboembolism (VTE) do not need thrombolytic therapy but patients with extensive deep vein thrombosis (DVT) or patients with a high-risk pulmonary embolism (PE) are candidates for thrombolytic therapy.
- Alteplase should be infused via a peripheral line and unfractionated heparin should be administered prior to and after the infusion. Activated partial thromboplastin time (aPTT) is used to determine the appropriate amount and dose of heparin.

THROMBOPHLEBITIS

Tags: Hematology

Definition:	Inflammation of a vein with a clot
Pronunciation:	throm-boh-fluh-BYE-tis

Prefix	Root	Suffix
thromb/o: clot	phlep/o: vein	-itis: inflammation

Clinical Pearls:

- Thrombophlebitis is the result of thrombus formation that results in phlebitis. Thrombophlebitis is a potential complication of many infections.
- Thrombophlebitis must be monitored for the administration of patients undergoing peripheral parenteral nutrition (PPN).
- This is a rare adverse effect of medroxyprogesterone, anastrozole, and fenofibrate. Infused medications that can cause thrombophlebitis include clindamycin, cytarabine, and posaconazole among others.

THROMBOPROPHYLAXIS

Tags: Hematology

Definition:	Prevention of a clot
Pronunciation:	throm-boh-PRO-fuh-lak-sis

Prefix	Root	Suffix
thromb/o: clot	pro-: before, forward	-phylaxis: protection

Clinical Pearls:

- Thromboprophylaxis is a term that is often a term synonymous with anticoagulation. While many of these same medications are used to previous a future clot, thromboprophylaxis refers to the practice of preventing a thromboembolic event, especially in an acute healthcare setting.
- Non-pharmacologic options include smoking cessation, compression stockings, intermittent pneumatic compression devices, and surgical inferior vena cava (IVC) filters for patients at high risk.
- Examples of medications for thromboprophylaxis include heparin (unfractionated and low-molecular weight), fondaparinux, and betrixaban.

THROMBOSIS

Tags: Hematology

Definition: Formation of a clot

Pronunciation: throm-BOH-sis

Prefix	Root	Suffix
	thromb/o: clot	-sis: state of, condition

Clinical Pearls:

- Thrombosis refers to a clot of any origin. The most common use of the term is deep vein thrombosis (DVT). While DVTs are not normally fatal, progression to pulmonary embolism (PE) can result in significant morbidity and mortality.
- Thrombosis formation is mediated by the enhanced aggregation of platelets that interact with blood factors and tissues that can lead to coagulation.
- The risk of thrombosis or thrombophlebitis for patients on combined hormonal contraception is a serious side effect and requires patients to stop therapy immediately. Possible symptoms include swelling in the legs or a sharp, severe pain in the extremities.

THYROTOXICOSIS

Tags: Endocrinology

Definition:	Increased levels of thyroid hormone in the body
Pronunciation:	thy-roh-tok-suh-KOH-sis

Prefix	Root	Suffix
thyr/o: thyroid gland, shield	toxic/o: poison	-osis: condition, abnormal state

Clinical Pearls:

- Thyrotoxicosis is when tissues in the body are exposed to excessive thyroxine (T_4) and triiodothyronine (T_3). Hyperthyroidism is only one of multiple causes of thyrotoxicosis, other causes of thyrotoxicosis include elevated levels of iodine, Graves' disease, and medication-related dose effects.
- Thyrotoxicosis presents as anxiety, nervousness, palpitations, and weight loss despite no change in appetite. Graves' disease may include other manifestations including enlarged thyroid gland (goiter) and thyroid eye disease (TED).
- Patients with a history of thyrotoxicosis should not receive levothyroxine. Patients with thyrotoxicosis are treated with methimazole or propylthiouracil (PTU) followed by radioactive iodine or surgery if ineffective.

TINEA

Tags: Infectious Disease

Definition:	Fungal infection of the skin
Pronunciation:	tih-NEE-uh

Prefix	Root	Suffix
	Latin origin (tinea)	-ia: condition

Clinical Pearls:

- Tinea refers to a superficial fungal infection. Patients that are immunocompromised are at a higher risk for infection, but tinea infections can occur in all patients. Moist areas of the skin are more susceptible to fungal growth. Tinea infections are defined by their location; tinea pedis (feet, athlete's foot), tinea manuum (hands), tinea cruris (pubic region, jock itch), tinea corporis (body, ringworm), and tinea capitis (scalp, ringworm) among others.
- Treatments for these infections are primarily topical and can be obtained over-the-counter (OTC) including clotrimazole, miconazole, terbinafine, tolnaftate, and ketoconazole, among others. More severe infections may be treated with oral antifungal agents including fluconazole, ketoconazole, itraconazole, and terbinafine.
- Patients should be counseled to effectively wash and dry area before application and take precautions including changing socks frequently and keeping the area dry. Most tinea infections are contagious, and care should be taken to avoid spread.

TINNITUS

Tags: Miscellaneous

Definition:	Ringing sound in the ear
Pronunciation:	tih-NYE-tus

Prefix	Root	Suffix
	Latin origin (tinnitus)	

Clinical Pearls:

- Tinnitus is an otic disorder where patients hear ringing in their ears in the absence of external sound. Most tinnitus is acute and subjective but can be diagnosed as a chronic condition.
- Tinnitus can be an initial sign of hearing loss, sinus pressure, ear obstruction, or a sign of another chronic disorder.
- Tinnitus is a medication-related adverse reaction for medications including NSAIDs (etodolac, indomethacin), furosemide, lithium, and phosphodiesterase inhibitors (sildenafil, tadalafil). Most medications that cause ototoxicity can cause tinnitus. Tinnitus is treated through discontinuation of the offending agent.

TOXICITY

Tags: Miscellaneous

Definition:	The state of being toxic or poisonous
Pronunciation:	tok-SIS-uh-tee

Prefix	Root	Suffix
	toxic/o: poison	-ity: state of

Clinical Pearls:

- Toxicity is a very broad term that includes poisoning from an ingested chemical. Toxicity can be particularly pronounced in children because of their small size (volume of distribution) and adipose fat distribution. Some medications or chemicals can be fatal in when consumed by children in relatively small amounts.
- Pharmacists play a significant role in the prevention of toxicity by educating patients on safe medication storage, using child-resistant packaging, and vigilance regarding symptoms of toxicity.
- Treatment focuses on removal of the offending agent. Treatment may include administration of an antidote, gastric lavage, activated charcoal, diuresis, or hemodialysis.
- Medications that are high-risk for toxicity include benzodiazepines (diazepam), opioids (morphine), iron, calcium-channel blockers, and acetaminophen.

TACHYPNEA

Tags: Respiratory

Definition:	Rapid respiratory rate
Pronunciation:	tuh-KIP-nee-uh

Prefix	Root	Suffix
tachy-: fast	-pnea: breathing	

Clinical Pearls:

- Tachypnea is a form of respiratory distress that isn't limited to pulmonary complications. Patients with tachypnea present with short, shallow, rapid breathing. Tachypnea can be a sign for a variety of disorders including infection (pneumonia, sepsis), thyrotoxicosis, toxicity, asthma exacerbations, and seizures among others.
- Tachypnea is elevated respiratory rate; normal respiratory rate for adults is between 12 and 20 breaths per minute.

URETHRITIS

Tags: Genitourinary

Definition:	Inflammation of the urethra
Pronunciation:	yur-ee-THRY-tis

Prefix	Root	Suffix
	urethr/o: urethra	-itis: inflammation

Clinical Pearls:

- Symptoms of urethritis include dysuria and urinary discharge.
- Patients presenting with urethritis should be tested for a sexually transmitted infection (STI).
- *Neisseria gonorrheae* is the most cause of urethritis, the second most common is *Chlamydia trachomatis*, which is the most common nongonococcal urethritis (NGU).
- Primary treatment of gonorrhea and NGU is azithromycin, often delivered as one high, single dose. Doxycycline or metronidazole are alternative agents for patients with recurrent infections.

URINALYSIS

Tags: Genitourinary

Definition: Analysis of urine

Pronunciation: yur-uh-NAL-uh-sis

Prefix	Root	Suffix
	urin/o: urine	-analysis: analyze, test

Clinical Pearls:

- Urinalysis is a common test of urine that can detect infection (white blood cells), diabetes (glucose and ketones), and kidney function (protein).
- Other common features measured by urinalysis include color, pH, and specific gravity, blood, bile, nitrates, and leukocyte esterase.

URTICARIA

Tags: Dermatology

Definition:	Hives
Pronunciation:	ur-tuh-CAR-ee-uh

Prefix	Root	Suffix
	non-constructed medical term	

Clinical Pearls:

- Urticaria is a term for hives; hives are a dermatological rash noted by red, raised bumps that often occur in response to an allergen exposure.
- Urticaria is considered a type I hypersensitivity reaction and is typically IgE-mediated.
- Patients who experience urticaria after a predisposing event (immunization, etc.) should be closely monitored for progression to anaphylaxis. Pharmacists should complete a comprehensive medical and medication history to determine the exact cause of urticaria.
- Chronic urticaria is treated with antihistamines such as cetirizine, fexofenadine, and other second-generation antihistamines.

UVEITIS

Tags: Ocular

Definition:	Inflammation of the uvea
Pronunciation:	yoo-vee-AY-tis

Prefix	Root	Suffix
	uve/o: uvea, vascular layer of the eye	-itis: inflammation

Clinical Pearls:

- Uveitis can be caused by a variety of disorders, but it most commonly occur as a result of eye injury, infection, or a larger autoimmune disease process such rheumatoid arthritis or inflammatory bowel disease.
- Uveitis can have a rapid onset, but symptoms are common to other ocular disorders such as eye redness, pain, and blurry vision. However, if untreated it can lead to blindness.
- Medications rarely cause uveitis. However, medications in case studies that have been associated include rifampin, zoledronic acid, and BRAF inhibitors such as dabrafenib, encorafenib, and vermurafenib.
- Treatment for localized uveitis includes corticosteroid eye drops followed by injections in severe cases. Treating the underlying disease process or associated inflammation can be effective; adalimumab is the only FDA-approved treatment for uveitis in non-infectious disease.

VAGINITIS

Tags: Women's Health

Definition: Inflammation of the vagina

Pronunciation: vah-jun-AY-tis

Prefix	Root	Suffix
	vagin/o: vagina	-itis: inflammation

Clinical Pearls:

- Vaginitis is a common disorder that can have multifactorial causes, both infectious and non-infections. While menopause, combination hormonal contraception, and sexually transmitted infections (STI) are potential causes, the most common cause is vulvovaginal candidiasis (VVC), or a yeast infection.
- The most common non-infectious type of vaginitis is atrophic vaginitis due to menopause. This is treated by systemic or vaginally-delivered estrogen to reduce dryness of the vagina.
- In patients who estrogen is contraindicated, lubricants and gels may be a non-pharmacological option to treat vaginitis.

VAGINOSIS

Tags: Women's Health

Definition: Abnormal condition of the vagina

Pronunciation: vah-juh-NOH-sis

Prefix	Root	Suffix
	vagin/o: vagina	-osis: condition, abnormal state

Clinical Pearls:

- Bacterial vaginosis (BV) is not vaginitis but the two terms after often used closely together based on overlapping symptoms.
- Signs and symptoms of bacterial vaginosis include itchiness, vaginal discharge, and foul-smelling odor. Vaginosis in not infectious and is not painful.
- Medications used to treat bacterial vaginosis include metronidazole or clindamycin. Patients should be counseled to refrain from sex during treatment and avoid douching, as this is a risk factor for development of BV.

VASCULITIS

Tags: Miscellaneous

Definition: Inflammation of the blood vessels

Pronunciation: vas-cue-LYE-tis

Prefix	Root	Suffix
	vascul/o: blood vessel	-itis: inflammation

Clinical Pearls:

- While vasculitis referrals to general inflammation of the blood vessels, it is clinically associated with a variety of unique diseases that often are associated with poor blood vessels that can result in organ damage such as the kidney, skin, or brain.
- Vasculitis can present in a variety of ways depending on the type of vasculitis present and the organ in question. Vasculitis of the skin often appears as red spots on the skin (petechiae), nodules or ulcers.
- Medications associated with vasculitis including vancomycin, allopurinol, and phenytoin among others.
- Patients with a history of vasculitis are contraindicated from receiving abciximab due to a high risk of hemorrhage.

VASCULOPATHY

Tags: Miscellaneous

Definition:	Disease of blood vessels
Pronunciation:	vas-cue-LAW-puh-thee

Prefix	Root	Suffix
	vascul/o: blood vessel	-pathy: disease

Clinical Pearls:

- Vasculopathy is a disease of the vasculature. A common clinical example includes cardiac allograft vasculopathy (CAV), a complication after a heart transplant.
- CAV is a life-threatening complication in patient who receive heart transplants. Patients are treated with statin medications (rosuvastatin, atorvastatin) as well as everolimus or sirolimus for long-term benefit.

VASOCONSTRICTION

Tags: Cardiology

Definition: Narrowing of blood vessel

Pronunciation: vay-zoh-con-STRIK-shun

Prefix	Root	Suffix
	vas/o: vessel; duct	-constriction: narrowing

Clinical Pearls:

- Many medical conditions are treated through vasoconstriction of the blood vessel; example conditions: shock, hypotension, glaucoma, and sinus pressure.
- Vasoconstriction is one mechanism by which serotonin receptor agonists are used to treat migraine (sumatriptan, rizatriptan). Patients with pre-existing cardiovascular disease and uncontrolled hypertension should avoid use of these medications.
- Other medications that work through vasoconstrictions include intranasal phenylephrine and oral pseudoephedrine, used to relieve sinus pressure and nasal congestion.

VASODILATION

Tags: Cardiology

Definition:	Dilation of blood vessel
Pronunciation:	vay-zoh-dye-LAY-shun

Prefix	Root	Suffix
	vas/o: vessel; duct	-dilation: widening, expanding

Clinical Pearls:

- Vasodilation, by a variety of physiologic mechanisms, is responsible for treating diseases including hypertension, pulmonary arterial hypertension (PAH), and angina.
- Common agents responsible for vasodilation are nitrates. Nitrates are available in various formulations as long-acting (isosorbide mononitrate) or rapid-acting (sublingual nitroglycerin).
- Treatment for PAH requires a variety of medications and mechanisms, which include epoprostenol (prostaglandin) and sildenafil (phosphodiesterase).

VENO-OCCLUSIVE

Tags: Gastrointestinal

Definition:	Compression of small veins
Pronunciation:	vey-noh-uh-KLEW-siv

Prefix	Root	Suffix
	ven/o: vein	-occlusive: seal

Clinical Pearls:

- Veno-occlusive disease is most commonly clinical associated with hepatoxicity; hepatic veno-occlusive disease is now known as sinusoidal obstruction syndrome (SOS). Other associated diseases include pulmonary hypertension (pulmonary veno-occlusive disease).
- SOS occurs as a result of damage done to the liver by chemotherapy. The resulting immunologic cascade creates an obstruction of the sinusoids in the liver and can result in hepatic failure. SOS clinically presents as weight gain, jaundice, and hepatomegaly.
- Gemtuzumab and Ozogamicin have a black box warning for hepatoxicity specifically due to SOS. Other examples of hepatotoxic agents include cyclophosphamide and busulfan.
- Patients with SOS should avoid hepatotoxic medications. Defibrotide is the only-FDA approved therapy for SOS after approval in 2016.

VENTRICULAR

Tags: Cardiology

Definition: Of a ventricle (lower chamber of heart from atrium); forces blood into arteries

Pronunciation: ven-TRIK-you-ler

Prefix	Root	Suffix
	ventricul/o: ventricle of heart or brain	-ar: pertaining to

Clinical Pearls:

- Ventricular is a term that when used with the heart, often refers to a group of arrhythmias that involve the ventricle: examples include ventricular tachycardia (VT) and ventricular fibrillation (VF).
- Ventricular is often a measure of cardiac output (CO) when a patient is diagnosed with heart failure. The left ventricular ejection fraction (LVEF) is used as a measure of CO and when a patient's LVEF is below 40%, patients are diagnosed with heart failure with reduced ejection fraction (HFrEF).

VERTIGO

Tags: Miscellaneous

Definition: Spinning, dizziness sensation defined by perception of one's surroundings

Pronunciation: VUR-tuh-go

Prefix	Root	Suffix
	non-constructed medical term	

Clinical Pearls:

- Vertigo is a disorder of balance that typically occurs as a disease of the inner ear. Potential causes include impaction of the inner ear (caused by cerumen), stroke, vision changes, infection, and dehydration.
- A common medication-related cause is ototoxicity caused from the administration of an aminoglycosides, such as amikacin. Other medications that can cause vertigo include, but aren't limited to, doxazosin, lamotrigine, methocarbamol, and diuretics.
- FDA-approved treatments include over-the-counter (OTC) products such as dimenhydrinate and meclizine; however, chronic vertigo should be evaluated for underlying causes and treated appropriately.
- Patients should be counseled that eardrops should be administered at room temperature to prevent vertigo.

VITILIGO

Tags: Dermatology

Definition:	Loss of pigmentation in patches of skin
Pronunciation:	vih-tuh-LIE-go

Prefix	Root	Suffix
	non-constructed medical term	

Clinical Pearls:

- Vitiligo is a depigmentation disorder of the skin that is considered to be autoimmune in nature. It is a chronic disease that can also cause whitening of hair and tend to expand over time.
- Vitiligo often presents on skin that has high-sun exposure. Patches will appear light and eventually lose all pigmentation. It is classified as either segmental or generalized based on the severity and disease activity.
- Vitiligo is typically treated with topical corticosteroids such as triamcinolone or hydrocortisone and calcineurin inhibitors (topical tacrolimus).

VULGARIS

Tags: Infectious Disease

Definition: Common

Pronunciation: vul-GAR-is

Prefix	Root	Suffix
	non-constructed medical term	

Clinical Pearls:

- Clinically, the term vulgaris is associated with acne vulgaris, one of the most common dermatological condition and can have significant impact on quality of life to the dermatological complications.
- The exact cause of acne vulgaris is unknown but is theorized to be a combination of genetics, environment, hormones, and diet that can potentially cause or worsen acne. Acne vulgaris is categorized into non-inflammatory and inflammatory based on severity.
- Treatment of acne vulgaris is multifactorial. The most common treatments are available over-the-counter (OTC) treatment and include benzoyl peroxide, salicylic acid, and adapalene among others which come in a variety of washes and topical applications. Higher strengths are available in prescription form.
- Patients should be counseled regarding the long-term nature of treatment. Patients who require prescription treatment may use topical antibiotics (clindamycin) and/or systemic tetracycline antibiotics such as doxycycline or minocycline.

VULVOVAGINIAL

Tags: Infection Disease

Definition:	Inflammation or infection of the vulva and vagina
Pronunciation:	vul-voh-vaj-uh-NYE-tis

Prefix	Root	Suffix
vulv/o: vulva	vagin/o: vagina	-al: pertaining to

Clinical Pearls:

- Vulvovaginal candidiasis (VVC) is one of the common mycotic infections. It is caused by *Candida albicans* and it is expected that a significant majority of women will experience VVC in their lifetime.
- Patients often present with itching, soreness, irritation along with burning on urination and vaginal discharge. There is not a specific laboratory test but is a clinical diagnosis that can be either self-diagnosed or assessed with a provider.
- Topical therapies such as butoconazole, clotrimazole, miconazole, and tioconazole are available for self-care and duration of therapy is 1, 3, or 7 days.
- Oral therapy such as fluconazole is available via a prescription along with topical therapies nystatin and teraconzoale. Oral therapy is considered equal to topical therapies.

XEROPHTHALMIA

Tags: Ocular

Definition: Dryness of the eye

Pronunciation: zee-ruf-thal-MEE-uh

Prefix	Root	Suffix
	xer/o: dryness	-phthalmia: condition of, or around, the eye

Clinical Pearls:

- Xeropthalmia is caused by a deficiency of the fat-soluble vitamin A. Patients who experience long-term nutritional deficiencies may present with xeropthalmia.
- Xeropthalmia can also be an adverse event of certain ophthalmic treatments, including olopatadine.
- Xeropthalmia is often associated with dry eye disorders (such as Sjogren's syndrome) and can be adequately treated with appropriate levels of vitamin A to reduce chance for blindness.

XEROSTOMIA

Tags: Miscellaneous

Definition:	Dryness of the mouth due to reduced salivary flow
Pronunciation:	zer-uh-STOH-mee-uh

Prefix	Root	Suffix
	xer/o: dryness	-stomia: condition of the mouth

Clinical Pearls:

- Xerostomia is commonly referred to as dry mouth and one of the most common presentations of adverse events due to medications. Xerostomia is the result of reduced salivary flow that can have detrimental dental effects.
- Xerostomia can be caused by many medications including tricyclic antidepressants (TCA) such as amitriptyline and doxepin, antihistamines such as diphenhydramine, and antidepressant medications including bupropion and citalopram in addition to other medications used to treat psychosis.
- Specifically, geriatric populations are at higher risk for xerostomia from anticholinergic medications. While commonly treated by saliva substitutes, a more effective treatment is substituting a medication of similar efficacy that does not cause xerostomia.